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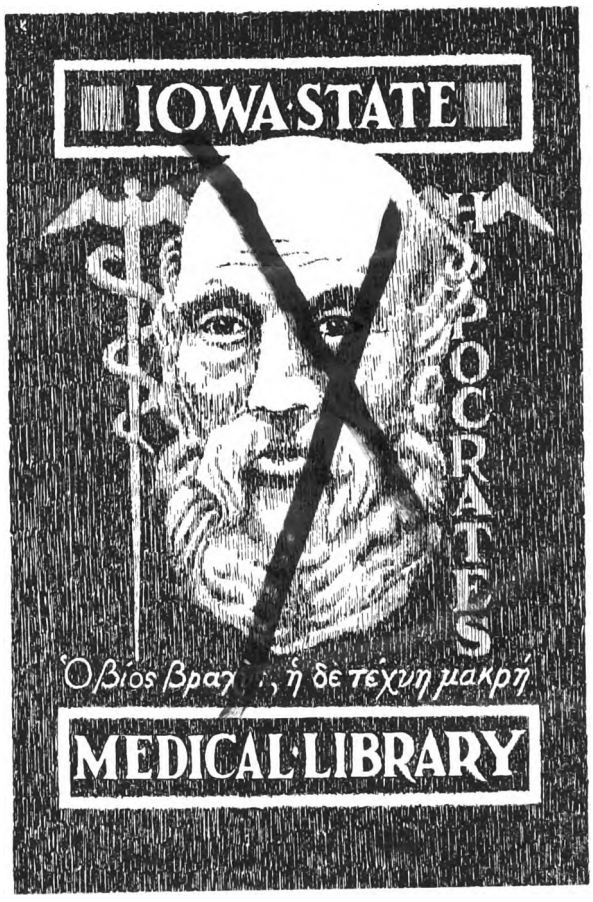

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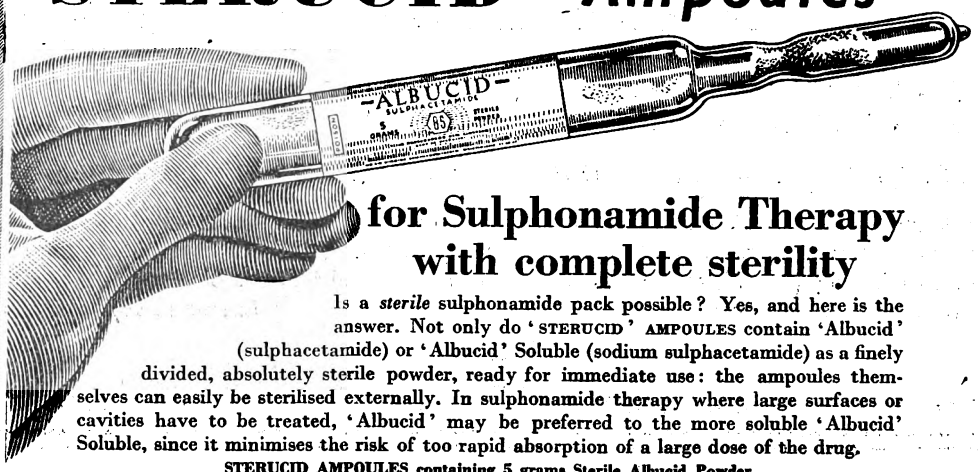

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CLINICAL PATHOLOGY: PAST AND FUTURE *

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M.D. Lond.

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JUST before the war of 1914–18 many of the county hospitals were beginning to appoint pathologists to their staffs. These were seldom whole-time laboratory workers, but usually consulting physicians with a liking for laboratory work. So began the symbiosis between consulting medicine and clinical pathology.

After the war it was found that laboratory aids to diagnosis had made considerable advances in the intervening period. Bacteriological knowledge had increased, and the method of blood-culture, which before the war had been a rather primitive affair, became a commonplace. Biochemical methods, which were just being introduced before the war, had been applied in the studies of trench nephritis, shock, and other conditions; so the estimation of blood-urea, urea-clearance tests, and other metabolic studies began to be applied to ordinary clinical practice. Lastly, blood-transfusion had become a reasonable method of treatment. Before 1914 it was a very considerable event and the technique extremely complicated. After the war blood-transfusion had been considerably simplified, although it was still a rather technical affair, and on the whole the pathologist was usually required to give the transfusion, because he could test the blood and was familiar with the apparatus.

RISE OF THE CLINICAL PATHOLOGIST

Thus it happened, somewhere between 1920 and 1930, that the clinical pathologist really began to exist as somebody who spent much of his time in the laboratory and at the same time assisted the clinician in diagnosis. He was distinct from the pathologist, who was usually a morbid anatomist, and from the bacteriologist and the biochemist. He was able to carry out or direct all the laboratory techniques applied to clinical methods, although he did not regard himself as an expert in any one branch of laboratory technique. At that time the methods were not so complex or so specialised that it was impossible for one man to be a reasonable master of all these things. On the other hand, except in the large towns, it was usual for him to combine this with consulting medicine, so that he would consult with the practitioner about a case, collect the specimens he felt would be useful, and then carry out or supervise their examination in the laboratory. At most of the London hospitals there was a department of clinical pathology, where the ordinary laboratory diagnostic work was done which before would have been done perhaps by the registrar, the more specialised investigations being handed over to the bacteriologist, biochemist, or histologist.

This arrangement, satisfactory at the time, has outgrown its usefulness. There was sometimes a mistaken idea that the clinical pathologist was the general practitioner of pathology, or that his work in the pathological department of a large teaching hospital was to relieve the departments of bacteriology, biochemistry, and histology of the excessive burden of routine work; though why he should be so overburdened that he could do nothing but routine work I do not understand. That is what happened, and by reason of this overburdening he was not able to keep abreast with, or take advantage of, all the advances that the fundamental branches were making. Occasionally, however, the advances were immediately applied to clinical practice, so that he was forced so to do. For example, the introduction of insulin treatment by Sir Frederick Banting in 1922 immediately made the laboratory control of diabetes of importance. Similarly, when Minot and Murphy in 1926 introduced the liver treatment of pernicious anæmia, it was desirable that the response to treatment should be watched by laboratory methods. Thus the laboratory took a further step forwards in its use to the clinician, for not only could it assist in the diagnosis and prognosis of disease but also on occasions was very necessary for controlling treatment, and this relationship has become ever closer and progresses continuously.

One of the disadvantages of the clinical pathologist who carried out all types of investigations was that he was seldom very good at any one of them; and, although there were academic departments of bacteriology, biochemistry, and morbid anatomy, yet hæmatology tended to be neglected. It was felt that hæmatology could well be encompassed by the clinical pathologist, who, however, though he had time for the ordinary day-to-day blood-counts, had little opportunity for making fundamental observations. For instance, sternal puncture was introduced by Arinkin in 1929, yet the first significant papers from this country discussing its use did not appear until some 9 years later, and most of the earlier papers came from clinicians interested in blood diseases and prepared to study this new method, which the clinical pathologist did not appear to have troubled to take up.

SPECIALIST TRAINING

By 1930 or so the feeling was growing that clinical pathology was a special branch of medicine which needed some training rather than something that one took up with the aid of a county hospital and an American textbook of laboratory methods. No doubt this change in viewpoint has been encouraged by the foundation of the Association of Clinical Pathologists, which, started in 1927, largely as a result of the enthusiasm of Dr. S. C. Dyke, of Wolverhampton, has grown rapidly in both size and importance. Another help was the establishment by the University of London of a diploma in clinical pathology. In 1935 a very significant event took place—the British Postgraduate Medical School was opened, where, owing to the wisdom of the late Prof. E. H. Kettle, the department of pathology was divided into four main sub-departments: bacteriology, biochemistry, morbid anatomy, and clinical pathology. These were roughly of equal status, and specimens from the hospital were submitted to each of those departments, according to the investigation required. It is true that the department of hæmatology was still called a department of clinical pathology, but this was to a large extent in deference to the traditional view, and for all intents and purposes one had at last got a hospital pathological department divided according to the type of work that was going to be done, and there was no longer this attitude of a department of clinical pathology carrying the burden of the routine work. The advantage of this new system is apparent both in the workers at the Postgraduate School and in the high standard of both routine and research work, and it is particularly in those branches which one can call clinical pathology that the most striking research investigations have been carried out.

RECOGNITION BY GOVERNMENT

Without doubt the war of 1939–45 has made a great deal of difference to clinical pathology, because for the first time pathology has really been recognised by the Government. It is true that the local authorities have for many years been responsible for providing diagnostic laboratory facilities in connexion with infectious and venereal diseases, but under the National Health Insurance scheme the necessity of laboratory methods in the treatment of insured persons has never been recognised. At one time it was proposed that laboratory facilities should be provided, and money was included

* Part of a paper read to the York Medical Society on Feb. 17, 1945.

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for this purpose in the National Health Insurance estimate before 1914, but the proposal was swamped in the excitement of the war and never reintroduced. Further, in the Dawson report it was suggested that there should be full laboratory facilities for all classes of patients; but the total effects of the Dawson report, a most brilliant piece of medical planning which had it been implemented would have avoided many of the difficulties and animosities that we are facing today, was a comment by the chief medical officer of the Ministry of Health that it had stimulated interesting discussions both within and without the profession.

DEVELOPMENT AND FUTURE OF EMERGENCY SERVICES

This war changed all that, and we have observed the growth, as an emergency arrangement, of the blood-transfusion service, the Emergency Public Health Laboratory Service, and the pathological laboratories of the Emergency Medical Service. The question must arise what will happen to these now the war is over; for, though they were instituted largely to deal with war casualties, they have been so blended into the medical services of the country that it is inconceivable that they should now cease.

Blood-transfusion Service.—Though pathologists are largely responsible for running this, I feel very strongly that, apart from the laboratory aspect of blood-transfusion, it is not a pathologist's duty. The observation in Russia that blood could be preserved for some time and remain effective for blood-transfusion was put into practice during the Spanish civil war; and first in America, and then in this country, the blood bank was started before the war, and, when hostilities were imminent, the Ministry of Health asked the Medical Research Council to organise a blood-transfusion service for the London area. An apparatus was devised which has been modified only very slightly in the subsequent years and has transformed blood-transfusion from a complex troublesome affair into a comparatively simple one. Further, the whole organisation of donor panels and so forth was set up. At first the Ministry of Health did not believe that there was any necessity for a blood-transfusion service of the same type in the provinces, but subsequently they were dissuaded of this view. Many voluntary organisations had already set up a blood-transfusion service before the Ministry took any interest.

Stored blood has come to stay, and the blood-transfusion equipment has also come to stay, but who is to be responsible for running the transfusion service and for giving the transfusion? Doctors are divided into two classes: those who like putting needles into their patients, and those who do not. It is interesting to recall that 1945 was the centenary of the introduction of the hypodermic syringe by Rynd of Dublin, and that, when Sir Clifford Allbutt was appointed to the staff of Leeds Infirmary, there was a considerable discussion about whether or not the physicians should request the surgeons to carry out hypodermic injections for them; and a little later Allbutt was not allowed to aspirate chests. Time and again in the later years, when some new form of needle exploration or needle injection was introduced, the pathologist was called in to do it. At first, lumbar punctures were often carried out by pathologists, and the same was true of aspiration of the chest; and so it is that in many cases the pathologist is called on to give a transfusion.

Now the administration of a transfusion is a therapeutic manœuvre and therefore must be the responsibility of the clinician in charge of the case, and there is no particular reason why the pathologist should be a mere technician for putting in a needle; nor should he take on himself to decide whether or not the blood should be given to a particular patient. Naturally his advice should be sought and his opinion given about the suitability of blood-transfusion in the treatment of a patient, but the final decision must rest with the clinician. On the other hand, the question of suitability of the blood for the patient requires laboratory investigation and so must be the responsibility of the pathologist.

Nor should the pathologist be responsible for the organisation of the blood bank and the collection of blood from donors. He would not be responsible for making up other therapeutic substances, and I see no reason why blood should be made an exception, although it is collected from human donors and not made from chemicals. The welfare of the donor and treatment of any untoward effects that may arise as a result of a blood-transfusion should be the responsibility of the clinician. I hope that now the war is over a blood-transfusion service will continue throughout the country, and that dried plasma and equipment ready sterilised will be provided from a few centres. The clinical responsibility for the donor panel and the blood bank should be in the hands of a physician at the hospital to which the blood-transfusion service is attached. The clinical pathologist should be responsible for the laboratory control of the blood collected and for the laboratory control of blood which is going to be given for transfusion, but the administration of the transfusion should be the responsibility of the clinician in charge of the case. Such a division is practical and reasonable. Naturally one hopes that the Red Cross or similar bodies will look after the social side of the transfusion service.

Emergency Public Health Laboratory Service.—This again was set up by the Medical Research Council at the request of the Ministry of Health, since it was anticipated that, owing to evacuation and damage to essential services, there might well be widespread epidemics which the existing laboratory organisation was not adequate to deal with. Accordingly the service was set up, staffed by skilled bacteriologists mainly drawn from universities; and, when war started, they took up their appointed places in improvised laboratories throughout the country. The expected epidemics, however, did not arise; and, although the bacteriologists were ready to assist hospitals and military camps, there was not nearly enough work for them. It was recognised that the local authority bacteriological service was not so good as it should be. It was too often a postal service to some large university or commercial laboratory, and there was little real epidemiological work, although naturally there were exceptions in certain areas. So the Emergency Public Health Laboratory Service offered to local authorities a full bacteriological service for a composite charge, and a very fine service they have provided. It had the great advantage that it was centrally coördinated, and there was pooling of information about outbreaks of infectious diseases. Hence it was possible to link up sporadic cases and sometimes find the source, often elusive, of an irregular epidemic.

What is going to happen to this service? One of the difficulties has been the arbitrary division between what is called public-health bacteriology and what is called clinical bacteriology. If a specimen of stool is to be examined, and the request says "Ulcerative colitis. ? nature of organism" it comes within the ambit of clinical pathology and should not be done by the Emergency Public Health Laboratory. If, on the other hand, the same stool is sent in with a request saying "Chronic diarrhœa. ? dysentery carrier" it can be examined by the Emergency Public Health Laboratory, and there is also the curious viewpoint that venereal disease is not a matter for a public-health laboratory. The division is clearly absurd and is not tenable on any grounds. The laboratory technique used in the bacteriological laboratory, whether primarily interested in epidemic disease or in the disease of individuals, is the same, and the division leading in some places to the establishment of two bacteriological laboratories in one small town is ridiculous.

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It is clear that bacteriology, from the clinical point of view, cannot be separated from the other branch of clinical pathology; so it is desirable that there should be a single bacteriological laboratory doing all sorts of bacteriological work. These bacteriological laboratories must be closely associated with the other clinical pathological laboratories—biochemistry, hæmatology, and morbid anatomy. It would be necessary for a few of the bacteriological laboratories to be more heavily staffed, so that they would be reference laboratories for special investigations, and they would have teams available to go out into the field and investigate large epidemics. But the staffing of all the laboratories should be such that the pathologist, whatever branch of laboratory work is his specialty, would have time to go to the wards, see patients, consult with his clinical colleagues, or make field investigations. It is desirable that there should be the central coördination of the information about epidemiological disease which was one of the great features of the war-time service, but this does not mean that there must be a public-health bacteriological service centred in London and coördinated with London and isolated and unrelated to the hospital clinical laboratories scattered throughout the country.

Pathological Laboratories of the Emergency Medical Service.—This laboratory service was a natural corollary to the Emergency Medical Service and has served a useful purpose. Like all the other branches of the E.M.S. it has worked well in spite of the organisation, largely because of the good will of the doctors working in it and not because of the brilliance of the bureaucratic planning of Whitehall. It has provided a clinical pathological service in parts of the country which never had it before, and it has attempted to achieve some degree of coördination, so that it is possible, where there are small laboratories which cannot have all facilities, for specimens to be transferred to larger laboratories.

CHARACTER OF A CLINICAL PATHOLOGIST

The first essential of a clinical pathologist is that he should have a wide knowledge of medicine—not only of laboratory medicine or the scientific aspect of the problem but also of the natural history of disease and its characters. He need not be (and indeed cannot be, because he will not have the experience) an expert clinical diagnostician in the sense of being skilled at percussion, palpation, and auscultation; but, provided with the clinical history and results of examination of a patient he should have a shrewd idea of the differential diagnosis and of the laboratory methods that may assist the diagnosis or the treatment. He must also be familiar with all the laboratory methods of value in diagnosis, their limitations and uses, and in at least one branch of laboratory methods he should be an expert. I only require that he should be an expert in one branch because clinical pathology has become so complex that it would be impossible for a man to become and remain an expert in bacteriology, biochemistry, hæmatology, and morbid anatomy. He should have had a training in all the branches but can only continue to advance in one main branch. His interest will remain in medicine, not only in the laboratory but also in the ward and the consulting-room, and always as a consultant, an adviser, not a clinician.

This distinction may seem subtle, but it is imperative that it should be recognised, and it is more difficult to recognise because the clinical pathologist has grown out of someone who was a physician who liked laboratories. Now he must become a laboratory worker who is interested in patients. It is sometimes argued that this is not practical because there is not a livelihood to be obtained in consulting medicine in the smaller cities and towns. I do not believe this. Naturally they must be subsidised, but there is no doubt that there is a grave shortage of good consulting physicians in the country; and, if their services were available for all cases where a general practitioner desired a second opinion, rather than being restricted to the patients who can be referred to a general hospital or those who can afford a consultant's fee, there would be ample work for them and therefore there should be money to pay them.

There is a real danger that the clinical pathologist may become a cheap (or perhaps an expensive) substitute for the consulting physician; if he does this, it will harm clinical medicine and clinical pathology. At present, while there is a shortage of medical staff, there is a tendency in hospitals for the clinician to take a rather cursory history and to fill up many forms for radiography, electrocardiograms, and pathological investigations. When these return, the diagnosis is reached, the treatment instituted, and the patient may be cured. But the clinician has never found out why the patient has a gastric ulcer or anæmia, nor looked into the underlying causal factors. In many cases, if more time was spent in taking the history and getting to know the patient, the same or a better diagnosis would be reached with far fewer laboratory tests; and, because in the process of finding out about the condition the clinician would also find out about the individual, the patient would be better treated. The doctor may be driving himself into a position in which he will be a mere office worker, collecting forms which are tabulated and correlated and stamped, and will no longer be interested in making sick people well. This is a very real danger and must be fought at all costs.

The other danger is that, if too good a pathological service is provided for an area—i.e., if there is a good pathological service and there are too few consultants—a pathologist will visit the smaller towns and assist the general practitioners. Almost certainly he will thus be forced into being a consulting physician, and I do not think he should; there should also be visiting consultants of all types to assist the general practitioner, and the pathologist should act in the same relation to the general practitioner as he does to the consultant on the staff of the hospital, as a colleague but not as something which he is not.

ORGANISATION OF A PATHOLOGICAL SERVICE

The pathological service of peace-time must be patterned on the hospital service, the organisation of which depends primarily on the population pattern of an area. Where a large population is gathered in a large town, there must be a large hospital, and the larger the hospital the more complex its services. In the large hospital, which will often be a teaching hospital, there will be a division of clinical pathology, staffed and divided into laboratories of bacteriology, biochemistry, hæmatology, and morbid anatomy. Most of the staff will be clinical pathologists—i.e., people willing and interested to go into the wards and see cases and discuss them with their colleagues, and not to spend their time entirely in the laboratory looking down microscopes or doing tests. They must, however, spend a considerable time in the laboratory, because it cannot be left to technicians, admirable craftsmen though they are, to carry out these tests without close supervision.

At the medium-sized hospitals of 300–400 beds a fairly large clinical pathological department would still be needed because the department would serve not only the patients attending the hospital but also the small hospitals in its vicinity and the practitioners of the area. A hospital of such a size should do almost all its own pathological investigations, but a few rather special examinations might have to be referred to the teaching-hospital laboratories.

The small hospitals, with about 100 beds, could probably do with either a single pathologist and technician or possibly a technician and a visiting pathologist. I am strongly opposed to the laboratory with an isolated

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technician without a visiting pathologist, because the technician is a skilled craftsman on whom it is not fair to put the responsibility of diagnosis. Although this has had to be done during times of shortage of staff it is not a policy that should be encouraged. When the pathologist visits the smaller hospitals he should do it in the same way as the consulting physician or surgeon and other specialists—to consult with the physicians and surgeons in charge of the patients there.

The pathologist from the larger hospitals should regularly visit the smaller towns that have no hospitals and be available for consultation and carrying out laboratory investigations on patients, either in their homes or at some convenient clinic; but a complete pathological service should not be provided before a complete consulting specialist service of other types; it is undesirable to provide one specialist service of a high degree of efficiency while the others lag behind.

It is most important that urgent swabs, material from lumbar puncture, and other specimens should be sent quickly to the main laboratories. Here use might be made of some survival of the Women's Voluntary Service, with dispatch-riders at the more outlying places, who could bring specimens into the laboratory at any time, and a pathologist should be available to examine them. For this reason there must be, so far as rural areas and small towns are concerned, a fairly good coördinated service with the larger hospital, but it need only be closely coördinated up to the level of the hospital which has a complete clinical pathological department.

Naturally, when talking of the future one ignores the difficulty that we are in at the moment, one that is going to persist for some time—the grave shortage of doctors. It will only be little by little that the service will improve.

RESEARCH

There is a tendency to place undue emphasis on the word research, suggesting that it is something rather magical and is associated with animal experiments, whereas all of us, if we enjoy our work and are interested and have the time, should and cannot help doing research; we want to know why this happens, or how much good this test is, or whether this new method is better than that, or possibly we may observe unusual results, often due to an accident, and, recognising their significance, follow them up and so perhaps make a contribution to scientific knowledge. Research is an attitude of mind and does not depend on animal experiments or complicated apparatus. But it does need time to think, and for the last five years we have all suffered from a lack of time to think, so that we have been working to the best of our ability but with that chronic tiredness by which one's standard drops little by little imperceptibly, and one does not realise that one is not doing good work, one just gets on with it in the hope of getting it finished. It is an appalling state of mind to have got into, and there are few that I have talked with that have not admitted that it has happened, and it will be some time before we wake up again and realise that medicine is really a very exciting subject. In the future we must be given that opportunity to think and to try out our thoughts and possibly make original contributions.

In a recent paper that Goldblatt read to the American Association of Clinical Pathologists he pointed out how very few original papers were published by clinical pathologists and attributed it to the fact that they were so busy with routine work that they had little time to think about what they were doing. One sees this difference very well in a university town, where the preclinical departments have only got teaching to do during term, and most terms only last probably a little more than half the year. Apart from their classes the teachers can do research work not only during the term but also throughout the whole of the vacation; whereas in the clinical department a teacher holds classes for four terms a year, each of three months, and does routine work all the time, without any leisure for thought. The only way to provide the opportunity for original work is to increase the staff.

I have always been impressed by the Scandinavian method by which hospitals are so staffed that all the routine work is finished in a long working morning, so that the emergency period, which in England starts somewhere between 5 and 6 P.M. and goes on till 9 A.M. next day, in Scandinavia starts at 2.30 P.M. and goes on till 8 A.M. next day. But during the afternoon the staff of a Scandinavian hospital have time to play at medicine; and they play either in the wards, in the laboratories, or in the scientific departments of universities. I believe that is one of the reasons why the standard of work done in the Scandinavian countries is of a remarkably uniform high quality—because they recognise the importance of leisure in the execution of good work. And this is just as true in diagnostic work as it is in research.

NEURONAL DAMAGE FROM TEMPORARY CARDIAC ARREST

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EXAMPLES of successful cardiac massage where the heart has stopped beating at operation are now numerous, but permanent success without cerebral damage is governed by the duration of cardiac arrest, the critical limit of which is at most 5 minutes. If this critical period has been exceeded and the heart has started again as a result of resuscitation, neuronal damage is likely to be proportionate to the duration of anoxia. The extent of this damage can only be fully assessed in those infrequent cases where "life" lasts for several days or weeks after the cardiac disaster. A case of this kind is reported here, in which there were opportunities for full neurological, electroencephalographic, and histological investigations.

The published work on this subject is limited. Tureen (1936, 1938) studied the functional and histological effects of complete experimental vascular occlusion of the spinal cord of animals by clamping the thoracic aorta. He checked the efficiency of the occlusion by a method of intravital staining. Complete occlusion for 15 min. was compatible with complete physiological and histological recovery of the anterior horn cells. Motor and sensory function recovered within 24 hours. Histological changes were present at 7 hours and maximal between 7 and 72 hours. Histological normality was reached in 6 days. The nerve-cell changes consisted of chromatolysis, nuclear changes, neuronophagia, and satellitosis. The interstitial reaction was apparently an inflammatory one, with capillary dilatation and proliferation, and lagged behind the demonstrable appearance of nerve-cell damage. It was therefore the anoxia that damaged the nerve-cells, not the interstitial reaction. Complete functional recovery was possible in spite of chromatolysis. The spinal cord was therefore less sensitive than the brain to anoxia. Motor power did not appear in any animal with an occlusion period of 20 min.; the critical period for the anterior horn cells appeared to be 15 min. Greenfield (1938) reviewed the experimental work on ischæmia and anoxæmia of the neurone and found that all experimenters had noted considerable differences in the resistance of different nerve-cells to ischæmia. The

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order of vulnerability, according to Gomez and Pike (1909, cited by Greenfield), is probably: (1) the smaller pyramidal cells of the cortex; (2) Purkinje cells; (3) cells of the medulla, retina, and spinal cord; and (4) cells of the spinal root ganglia. As a result of the work of Gildrea and Cobb (1930) Greenfield concluded that the cortical neurones might be irreparably damaged after 5 minutes' anoxia.

Rossen, Kabat, and Anderson (1943) investigated the effects of arrest of cerebral circulation in man, using a cervical pressure cuff inflated to 600 mm. Hg. They found that periods of complete occlusion were tolerated up to 100 sec. with complete recovery. Consciousness was lost in 5 sec. Fixation of the eyes took place just before loss of consciousness, and anoxic convulsions were noted after loss of consciousness. Electroencephalographic changes showed large slow waves appearing when consciousness was lost. Electrocardiographic changes were minimal. They calculated that the basal oxygen requirements of the brain demanded 1400 c.cm. of blood per min., and that the brain received a third of the ventricular output at rest, though it represented only 2% of the body-weight.

This paper shows the extreme sensitivity of the brain to anoxia, the rapidity of the results of oxygen lack, and the avid metabolism of oxygen by the brain.

CASE-HISTORY

A healthy married woman, aged 32, was operated on for recurrent appendicitis and a small right ovarian cyst, on July 16, 1945. Anæsthesia was induced with 'Pentothal' 0·5 g. and then gas and oxygen, following a spinal (1·5 c.cm. of heavy 'Nupercaine'). The operation (C. R. McL.) was brief and simple, and had almost been completed when a sudden cardiac failure was reported without preliminary venous congestion. Ordinary resuscitation and intubation having failed, transdiaphragmatic cardiac massage was started. The heart was completely inert and flaccid. After massage for 7 min., during which intracardiac adrenaline was given, a faint regular impulse was felt, which soon increased dramatically to vigorous pounding contractions—rate about 90 per min. Within a short time the cardiovascular condition was stabilised, and it remained in every respect satisfactory.

Six hours later, abnormal neurological findings included absent corneal reflexes, an external strabismus, increased knee-jerks with left ankle and knee clonus, and an extensor plantar response on the left side while the right was ambiguous.

Fig. 1—The mask-like facies.

At 10 hours the patient showed a modified "decerebrate rigidity." The plantar response was a mass withdrawal, and her facies was mask-like and expressionless (see fig. 1), never altering till her death. Lumbar puncture showed no abnormality of pressure or fluid (cells 7 per c.mm.; protein 40 mg. per 100 c.cm.). From this time the depth of unconsciousness remained the same, the only response being to powerful painful stimuli. After 24 hours all deep reflexes were equal and present. The upper limbs were moderately flaccid, while both lower limbs showed "clasp-knife" rigidity. The eyes were half closed, and the corneal reflexes could be elicited only with difficulty. The plantar response was equivocal, but appeared to be flexor on both sides. Subsequently the deep reflexes and the degree of hypertonia were variable from day to day.

Feeding was carried out with an indwelling Ryle's tube, through which a fluid diet of 3000 calories a day was given, with generous vitamin content. This was effective, in so far as she showed no loss of weight or dehydration at any stage.

On July 24, eight days after operation, she had two "seizures" (not seen by a doctor); these involved jactitation of the arms with the legs immobile, frothing at the mouth, and biting of lips, and were apparently precipitated by the movements of routine nursing. The same day Air Commodore Denis Brinton reported:

> This N.C.O. shows no signs of appreciating any visual or auditory stimuli, but makes appropriate movements of

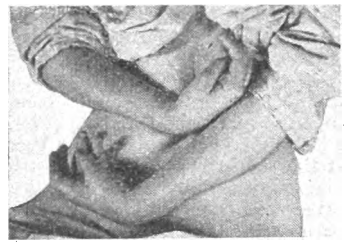

Fig. 2—Attitude assumed by the patient's arms.

Fig. 3—Extensor plantar response accompanied by retraction of leg.

withdrawal to powerful painful stimuli, and indeed to so slight a stimulus as pinching the skin of the forearm. When she is disturbed, there are occasional groans and grinding of the teeth. The pupils react normally to light. The upper limbs are adducted at the shoulders, slightly flexed and pronated at the elbows, with fingers and thumbs flexed into the palms (see fig. 2). At the beginning of the examination there was hypertonia of each upper limb, but much more pronounced on the right; later, this has varied considerably, each limb (at times, and when she appeared quietly asleep) seeming almost hypotonic. Both lower limbs were markedly hypertonic, particularly in adduction, in extension at knees, and in plantar flexion. There was a bilateral extensor response with a very wide zone (see fig. 3).

In my opinion, the period of several minutes over which the heart stopped led to an anoxæmia which has irreversibly affected the nerve-cells of certain parts of the cerebral hemispheres, while others, less sensitive to deprivation of oxygen, have managed to recover. The cells at the highest levels have suffered most, those at the lowest the least, those at intermediate levels intermediately. I do not think there is the smallest chance of further recovery, and I am certain that if she survives she must do so in the state of profound dementia in which she is now found. No treatment can undo these irreversible changes, though supplying her with food and nutriment may preserve life until an intercurrent pneumonia supervenes.

By Aug. 8, three weeks after operation, her condition was virtually unchanged, and she was transferred by air to St. Hugh's, Oxford. Major George Smyth reported that, on arrival, she was deeply unconscious and not reacting to any form of stimulation. Eyes half open. Skin hot and dry and face flushed. Slight cyanosis of the lips. Moderate sweating. Breathing noisy, with sucking-in of the cheeks with each inspiration.

Optic nerves showed no reaction to menace. *Fundi* normal, but edges on the nasal side a little blurred—this was within normal limits. *Oculomotor, trochlear, and abducent nerves:* pupils moderately dilated and slightly eccentric, equal, and reacted promptly and through a good range to light. Eyes wandered aimlessly, and there was a lack of parallelism, there being a tendency to divergent squint. Nothing suggested any gross paresis, but extent of movement could not be tested. *Trigeminal nerve:* both cornea remarkably brisk and equal; some rigidity of jaw; jaw jerk not increased. *Facial nerve:* no asymmetry.

Motor functions: arms adopted a position of moderate adduction, with flexion of about 90° at the elbow; forearm semipronated; wrists and fingers flexed, with thumb strongly adducted and flexed inside the other digits. Postures not maintained. Hands swung about equally when shaken.

Tone: slight increase at the elbow—the biceps muscles were mostly affected. The hypertonia was of plastic type. The hands and fingers showed a much greater degree of hypertonus and could not be extended to the normal degree—i.e.,

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the hypertonia was maximal distally. The first dorsal interossei were unusually soft on each side. In comparison with the rest of the musculature they suggested some local wasting. Both lower limbs were in extension. Very slight hypertonia was equally felt in the quadriceps and hamstrings. There was already a permanent contracture of the calf muscles. There were no voluntary or involuntary movements of any of the limbs.

Reflexes.—On both sides the arm tendon reflexes were exaggerated; knee-jerks and ankle-jerks were present; abdominal reflexes absent; plantar reflexes extensor.

There was no stiffness of neck. Bladder not distended. Incontinence of urine. *Heart* showed no abnormality, pulse-rate 120, pulse of poor volume. *Lungs* gave bubbling rhonchi all over but no dullness. Breath sounds normal.

Aug. 9.—Her condition was stationary. Temperature up to 102° F. Eyes three-quarters closed as a rule, but opened now and then; pupils continued to react well to light. There was no response to sudden loud noises. To menacing there was an occasional blink, but this might have been due to the draught so caused. On vigorous pinching there was very slight flexing of the ipsilateral arm, and she made a low groaning sound. No sucking reflex on stimulation of the lips. No swallowing. The jaw was for most of the time tightly clenched as from a severe trismus, and then the teeth could not be forced apart. Tonic neck reflexes could now be clearly demonstrated. On firm rotation of the head, the arm on the side to which the head was turned extended, and the hypertonus in the biceps group almost entirely disappeared. On the other side there was a simultaneous increase of tone in the biceps and in the flexors of the wrist and fingers, and the forearms flexed slightly. This distribution of tone was reversed when the head was rotated in the opposite direction. It was not possible to demonstrate any definite alteration in the distribution of tone in the lower limbs. The excess of tone was most marked in the hamstrings. At rest the upper limbs lay in moderate flexion and semipronation, with the fingers flexed; the lower limbs were moderately flexed at hips and knee. Each leg withdrew on being pinched.

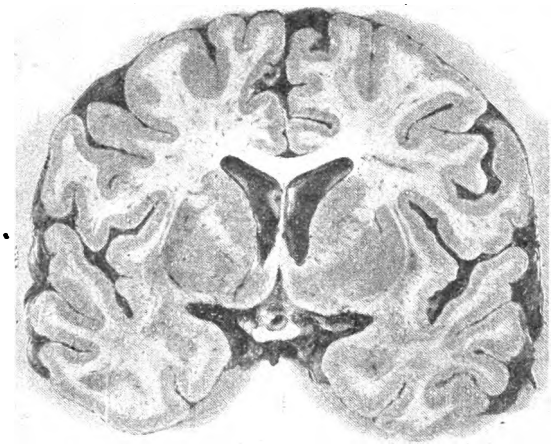

Fig. 4—Section of brain (fixed in 20% formol-saline) showing widening of sulci, thinning of cortex, and areas of pallor (especially in right corpus striatum).

Major Smyth drew special attention to the following points:

(1) The peculiar nature of the coma. Although all higher cerebral activities were in abeyance, the brain stem appeared to be remarkably active.
(2) The fact that fits occurred at all is of interest in view of the evidence for an almost complete wiping out of cortical cells.
(3) Although the damage fell most heavily on the cortex it would be interesting to know about the changes in ganglion cells lower down in the brain and in the spinal cord. There was definite atrophy of the small muscles of the hand, and there might be considerable changes in the anterior horn cells.

Electroencephalographic report (Wing-Commander Denis Williams).—Records were made on Aug. 8 with bipolar and monopolar leads, with electrodes in standard positions, in two rows midway between the vertex and the sylvian fissure from the hair-line to the occiput. Records were unusual for a person in an unconscious state, because they all consisted of virtually straight lines. The only evidence of any electrical activity was the short runs (½ second) of very-low-voltage sine waves, 5 per sec., which occurred irregularly at about ½ minute intervals. In any patient who has an impairment of consciousness, abnormal slow waves recorded from all leads are the rule, the period and voltage of the waves corresponding to the impairment of consciousness. In this instance although the patient responded only to very painful stimulation by slight facial movement, the eyes were open and there was blinking, and the appearance and physical state were not those usually associated with coma. Concurrent electrocardiogram and records of respiratory movements did not reveal any information of interest.

Records taken two days later did not show any change, and the patient died of pneumonia and pyelonephritis on Aug. 11, twenty-six days after operation.

AUTOPSY

An autopsy, made within 5 hours of death, showed bronchopneumonia, degeneration of cerebral and basal ganglia, pyelitis, and cystitis.

The body was that of a young woman with soundly healed recent appendicectomy and upper midline abdominal scars. Rigor mortis was not present, and there was some warmth in the deeper tissues. The trachea and bronchi contained a considerable quantity of purplish fluid. The lungs were congested, and firm areas of bronchopneumonia were present. The cardiovascular system was natural, apart from slight atheroma of the aortic valve. The gastro-intestinal tract was natural, except for a few adhesions round the cæcum at the site of the operation, with absence of the appendix. The liver appeared somewhat fatty. Both kidneys were congested, with pus in the pelves. The bladder contained thick urine and showed a mild cystitis. A small cyst in the right ovary.

The skull and dura were natural, the dura sinuses containing post-mortem clot. The sphenoidal and posterior ethmoidal sinuses contained pus. There was a considerable excess of fluid in the subarachnoid space over the surface of the brain, and there was slight widening of the sulci, especially in the parietal regions. No thrombosis or other abnormality of the superficial blood-vessels was seen. The brain as a whole was not abnormal in consistence on palpation, and there was no discoloration of the surface. The spinal cord was natural externally, and in consistence.

The brain and cord were fixed in 20% formol-saline and sectioned, when there was seen to be moderate generalised ventricular dilatation with notable widening of the sulci, well seen over the island of Reil (fig. 4), and a slight general diminution in the thickness of the cortex, which was only 0·25 cm. thick in the frontal region and showed an unusual degree of pallor in its outer part (fig. 4). The basal ganglia showed no abnormality, apart from irregular areas of pallor, the largest being in the right corpus striatum (fig. 4); nor did the white matter, apart from a slight greyish-pink discoloration adjacent to the calcarine cortex. The cerebellum and cord showed no macroscopic abnormality.

MICROSCOPICAL FINDINGS

Histologically, the organs showing pathological change were the lungs, with acute bronchopneumonic changes and moderate œdema; the liver, showing congestion, with central fatty degeneration and pigmentation; the kidneys, congested and with cloudy swelling of the convoluted tubules; and the uterus, with a fibroid.

Portions of the central nervous system were stained with hæmatoxylin and eosin, hæmatoxylin and van Gieson, Mallory's phosphotungstic-acid hæmatoxylin, Masson trichrome, Nissl's method with toluidine blue, Scharlach R, Weigert-Pal's method, and various silver-staining methods for neuroglia, microglia, and nerve-fibres.

Lumbar cord: many of the anterior horn cells showed changes, some being slightly shrunken and staining darkly, others slightly swollen and staining more lightly. The latter had pale-staining glassy cytoplasm, and some showed powdery Nissl's substances, while a few had fairly well-marked Nissl's granules peripherally. The nuclei were seldom eccentric or indented, except a few in the glassy cells. The nuclei of most of these stained poorly, and many had dark blue granules on the nuclear membrane. Some of the anterior horn cells contained pigment, not greater in quantity than is found in the aged, but possibly of abnormal amount for one so young. There was no striking change in the glia.

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Thoracic cord: the picture was very similar to that seen in the lumbar cord, though there was somewhat better preservation of the Nissl's granules, and there were more of the slightly shrunken dark-staining cells than of the slightly swollen pale-staining variety. One cell at least showed well-marked perinuclear Nissl's granules with peripheral clear zone.

Cervical cord: most anterior horn cells in this region showed well-formed Nissl's granules, though some of the cells were a trifle shrunken. A few showed powdering of Nissl's substance, and a very few had "glassy" cytoplasm. Some were elongated, with masses of pigment at either side of the nucleus. Taken altogether, the cells in the cervical cord were more normal in appearance than those seen in the lumbar and thoracic regions.

Medulla and pons: the cells of the hypoglossal nucleus had in general a more rounded outline than usual, and most of them showed powdering of the Nissl's substance, though none had a truly "glassy" cytoplasm. The nucleus was eccentric in several, and in some showed indentation of the nuclear membrane. A few cells were shrunken, with a rather uniformly dark blue staining of the cytoplasm. There was a slight excess of sudanophil material in most of the cells of this nucleus. The nucleus of the abducens nerve showed similar changes to a lesser degree. In the locus cœruleus many of the cells had a very eccentric nucleus, and in some the cell body was also deformed.

Cerebellum: the Purkinje cells were much reduced in number, many empty baskets being seen. The cells remaining showed a fairly normal Nissl's picture. There was a varying degree of gliosis in the molecular layer, with a corresponding increase in the number of microglia in different areas of the cerebellar cortex. No obvious change was seen in the granule cells or in the dentate nucleus.

Mid-brain: the cells of the oculomotor nucleus showed some rounding of their outline, with powdering of Nissl's substance. A few nuclei were eccentric, and one had an eccentric nucleolus. A few cells were slightly shrunken and more darkly stained than usual. The cells of the substantia nigra were essentially normal.

Basal ganglia: here extensive and severe changes were seen. There were irregular focal areas of necrosis in the caudate nucleus and putamen. In these areas vascular proliferation was well advanced, many new capillaries having grown in. Masses of fat-granule cells were present in the centre of the foci, and more peripherally microglial cells were seen in all stages of activity, from early amœboid change, with retraction and thickening of their processes and the appearance of sudanophil material within them, to fully formed foam cells or compound granular corpuscles. There was a well-marked proliferation of fibrillary astrocytes round the periphery, with increase in the glial fibre network. The picture was characteristic of an early stage of organisation of an area of necrosis into a cerebral cicatrix or glial scar.

In the thalamus there were fairly large areas in which it was impossible to see any nerve-cells. In these areas all the astrocytes had swollen cell bodies from which thick fibrous processes radiated. No softening of the nervous tissue or fat-granule cells was seen in the areas.

Cornu ammonis: there was a great loss of pyramidal cells, mainly in the area HF of von Economo (1929) but also in area HE 1 B, with relative sparing in Sommer's sector HE 2. The nerve-cells still present were fairly well preserved, though some showed shrinkage, with eccentricity of the nucleus and indentation of the nuclear membrane. In the regions of loss of pyramidal cells there was a great increase of microglia, many being "amœboid" forms containing sudanophil material. The astrocytes here had proliferated and had swollen cell bodies, with many thick glial fibres radiating from them. The degree of destruction of the pyramidal cells was not completely uniform but to a slight extent focal and laminal. The cells of the dentate fascia appeared normal.

Precentral (motor) cortex: the loss of nerve-cells in this region is very great, layer V, the layer of giant pyramidal cells of Betz, being the only recognisable layer, the pyramidal cells elsewhere being absent, and the Betz cells being reduced in number.

The changes in the surviving cells range from the stage of swollen cells with glassy cytoplasm, the nucleus being a faint ghost or invisible; glassy cytoplasm, with nucleus outlined but eccentric and with no nucleolus; glassy cytoplasm and fairly normal nucleus; up to the stage of powdering of Nissl's substance, most of the cells seen being in this relatively well-preserved state. There was some increase in the microglia throughout the cortex, and everywhere were to be seen big swollen-bodied astrocytes, usually having stout and easily stained glial fibres.

The degree of gliosis was much the same as in the severely affected areas of the cornu ammonis. Again the destruction of pyramidal cells was not completely uniform. There was a loosening of the texture of the outer layers of the cortex, with considerable increase in the pericellular spaces. Weigert-Pal preparations showed many degenerate myelin sheaths and many bizarre myelin forms; globules, eccentric protrusions, and tennis-racquet forms.

Prefrontal cortex: the picture is essentially similar to that seen in the precentral cortex, those pyramidal cells which were left being in the same relatively good state of preservation. The microglia were increased in number and often had their long axes at right angles to the surface. There were few showing an amœboid form. Swollen astrocytes were abundant throughout the cortex.

Occipital cortex: here also was a very great, almost complete, loss of ganglion cells. The microglial proliferation was the most striking feature, most of these cells being "amœboid" forms and containing sudanophil material, though none was at the stage of fat-granule cells. There was more sudanophil material in this region than elsewhere in the cortex. The gliosis was similar to that seen in other cortical areas examined.

Cortex of superior temporal gyrus: the changes in this region differed in no essential way from those in the other cortical areas examined. There was the same loss of pyramidal cells, proliferation of astrocytes, and increase in microglia seen elsewhere.

General features of the central nervous system: the leptomeninges were nowhere unduly thickened. There were a few small rounded cells and an occasional macrophage in the subarachnoid space, but no great excess.

The blood-vessels throughout showed no gross abnormality, and no thrombosis or perivascular hæmorrhages were seen. The capillaries had proliferated in the areas of necrosis of the basal ganglia, and here and there in the cortex there was perhaps a slight increase in their numbers, though it was hard to be certain of this.

The nuclei of very many pyramidal cells showed small darkly stained granules, though whether these were on the nuclear membrane or inside it it was difficult to say. There was an excess of lipochrome pigment in all cells which normally contain this pigment throughout basal ganglia, brain stem, and spinal cord.

In all regions where the pyramidal cells showed severe chromatolysis, Bielschowsky staining revealed a breaking up of neurofibrils within the cells, an argentophil granular material being left. Some small rings at the ends of fibres were also seen.

DISCUSSION

Electroencephalogram.—Some normal subjects show very little of the normal electrical activity in the electroencephalogram, but with increases in amplification it is usual to see some fast waves. In this case the complete absence of any form of alternating potential difference marked the records as being quite abnormal. The only explanation which seems possible in the particular circumstances of this case is that there was widespread and complete cessation of cerebral activity—that there was death of, rather than damage to, cerebral neurones.

Histological changes.—The cortical damage found clinically and shown by the electroencephalogram was confirmed by histological examination. The great bulk of the pyramidal cells of the cerebral cortex had vanished, and the relatively few survivors showed evidence of various degrees of chromatolysis. It seems probable that the changes undergone by these cells were reversible, and that some of them were on the way to the restoration of normal Nissl's picture.

The damage to the occipital (visual) cortex was so severe that it is possible to state with certainty that the failure to respond to menace was due to bilateral cortical blindness. The findings of many investigators have been that the occipital cortex suffers severely and early in cerebral anoxia, and in this case the severity of the damage to this region was also perhaps more severe than that found elsewhere in the cortex.

The destruction of the cortex of the superior temporal gyrus was almost equally great and was such as to make

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it clear that the failure of response to auditory stimuli was due to bilateral cortical deafness.

An interesting feature was the relatively good state of preservation of those giant cells of Betz in the motor cortex which had survived, and the fact that more of these cells had survived than any other pyramidal cells of the cortex. Nevertheless, these cells were present as only a small fraction of the normal number, and most showed some sign of damage.

The presence of pupillary reflexes showed that the retinæ were not hopelessly damaged. This fact and the presence of spontaneous ocular movements suggested that there was not total irreparable damage to the oculomotor nuclei, which were, in fact, remarkably well preserved.

The correlation of the clinical picture with the damage to the basal ganglia is fraught with difficulty, but it may be said that the clinical picture of brain-stem activity differed little from the normal, and the nuclei of the brain stem as a whole were seen on histological examination to be neither extensively nor irreparably damaged.

The spinal cord showed histologically some damage to anterior horn cells, perhaps more than would be expected in view of the relative resistance of anterior horn cells to anoxia which has been found experimentally. The damage to, and probable loss of, anterior horn cells in the cervical region was reflected in the wasting of the small muscles of the hands. It is possible that cell counts will establish the percentage loss.

Cardiac arrest.—The exact duration of cardiac arrest in this case cannot unfortunately be stated in minutes and seconds, but a careful assessment of all the evidence has been made. The sequence of events was as follows:

(1) A state of pulselessness in the radial and temporal arteries was first observed at the end of the appendicectomy operation; this was confirmed by precordial palpation. This can be regarded as zero time.

(2) Tracheal intubation and oxygen insufflation were then carried out, a pharyngeal airway having been used until this time. For this manœuvre it is reasonable to allow 2 min.

(3) Intravenous 'Coramine' was now given, the heart auscultated, and no heart sounds were heard. This occupied 30 sec. to 1 min.

(4) The abdomen was then opened by a midline incision, a manœuvre which would occupy 30–60 sec.

(5) Direct transabdominal cardiac massage was then started.

(6) Cardiac massage was timed to last 7 min. before re-establishment of heart beat.

From the above evidence of the surgeon, anæsthetist, theatre sister, and anæsthetic assistant the duration of cardiac arrest can be placed between 10 and 11 min. It is unlikely to have been less and may possibly have been more. Zero time is taken as that moment when pulselessness was first noted in the radial and temporal arteries, but cardiac arrest may have been established before this. The exact passage of time is difficult to assess in an operational crisis, and we therefore put forward no hard and fast claim for the period of cerebral anoxia.

This case is therefore in agreement with the experimental observations of Gildrea and Cobb (1930), which indicate that the cortical neurones die after 5 minutes' complete arrest of the cerebral circulation, whereas the neurones subserving the lower motor and reflex functions may, according to Tureen (1936, 1938), survive 15 min. of complete blood stasis.

SUMMARY

A case of cardiac arrest in a woman, aged 32, is reported in which the duration of the cessation of heart action has been computed at 10–11 min.

The heart was successfully restarted by transabdominal massage.

The patient survived for 26 days and died of pneumonia and urinary infection.

During this time she showed certain neurological features associated with cerebral damage resulting from anoxæmia.

The electroencephalographic, pathological, and clinical pictures are described and correlated.

We wish to thank Air Marshal Sir Harold Whittingham, late D.G.M.S., R.A.F., and Group-Captain W. A. S. Duck, R.A.F., O.C. R.A.F. Hospital, for their help; Air Commodore Denis Brinton, R.A.F., Major George Smyth, R.A.M.C., and Wing-Commander Denis Williams, R.A.F., for permission to incorporate their reports; and Dr. J. G. Greenfield for his personal communications and advice.

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ACUTE NECROSIS OF THE LIVER
TREATED WITH PROTEIN HYDROLYSATES

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IT has long been held that a high-carbohydrate diet is beneficial in cases of liver damage, but recently interest has become focused more on the prophylactic and curative effect of proteins, and of specific amino-acids. Weichselbaum (1935) fed albino rats on a basal diet deficient in cystine and methionine. A significant number of animals during the sixth week refused food, showed clinical features of icterus, and unless given cystine died within three days of the symptoms becoming pronounced. Animals on a basal diet supplemented with methionine or cystine did not become ill. Miller and Whipple (1942) demonstrated that methionine administered to protein-depleted dogs, before chloroform anæsthesia, gave complete protection against liver damage. They also showed that methionine given three or four hours after chloroform anæsthesia gave significant protection against liver injury following the anæsthesia. Beattie and Marshall (1944) attempted to control the occurrence of liver damage in syphilitics under treatment with neoarsphenamine. Cystine and methionine had no effect on the overall incidence of liver damage but were effective in shifting the time of peak incidence of liver damage towards the end of the second course of antisyphilitic treatment or later, and the severity of the liver damage, when this did arise, was moderated. Not all workers, however, claim success with amino-acid therapy. The oral treatment of infective hepatitis with methionine by Higgins et al. (1945) and Wilson et al. (1945) does not appear to have produced any distinct benefit.

The emphasis recently laid on the importance of high-protein diets is largely based on experiments on animals. Long-continued lack of certain amino-acids will bring about liver damage, and such livers are more susceptible to poisons. Bollman (1938) states that hepatic damage following the poisoning of a dog's liver with carbon tetrachloride is made worse by a diet consisting solely of lean meat. Mueller and others (1943) have worked out the nitrogen balance in four healthy men taking enzymic casein hydrolysate by mouth. They found the minimal requirement of hydrolysate for maintenance of nitrogen equilibrium to be 0·4–0·7 g. per kg. This indicates its approximate equivalence with intact protein and serves as a basis for the parenteral administration of hydrolysates. Further, they found that their subjects complained of lassitude and asthenia after forty-eight hours of feeding on a protein-deficient diet, and that

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these symptoms rapidly disappeared after the second day of supplementation with the hydrolysate.

In the case reported here, casein hydrolysates containing both cystine and methionine were given intravenously. They were the only source of protein for five and a half days; 180 g. was given in 132 hours, this being about 0·45 g. per kg. of the patient's weight. Apart from its intrinsic value, an adequate supply of glucose is essential as a protein sparer.

Himsworth and Glynn (1944) are of the opinion that massive hepatic necrosis and its sequel, nodular hyperplasia, may be attributed to a trophopathic hepatitis. A toxipathic agent causes the liver cells to swell; this restricts the intrahepatic circulation and so diminishes the amount of protective nutriment available to the liver cells. If the amount of circulating protective factor is small, massive necrosis results. In our patient anorexia and vomiting progressively reduced the amount of protective nutriment available to the liver cells; and, when coma supervened, this exogenous supply failed entirely. We suggest that the intravenous infusion of essential amino-acids and glucose raised the protective nutriment in the hepatic circulation sufficiently to enable the liver cells to regenerate.

CASE-RECORD

A man, aged 36, was involved in a motor-car accident on June 29, 1945, sustaining a small flesh wound of the leg, a simple fracture of the upper third of the femur, a depressed fracture of the malar bone, and fractures of the lumbar transverse processes. He had severe shock and was resuscitated with a pint of blood and a pint of plasma. Next day a systemic course of penicillin was begun. He was transferred to this hospital on July 9, when he was found to have a temperature of 101° F and cough with bloodstained sputum. Radiography confirmed the diagnosis of bronchopneumonia. He was treated with sulphonamides, and his chest cleared. On Aug. 27 he had a slight recurrence of chest symptoms, but this responded rapidly to treatment.

On Sept. 7 a fellow patient, who during six weeks had visited him frequently in his side room, became jaundiced. On the 13th our patient's evening temperature, which had previously been normal, rose to 99·4° F, and next day he had anorexia, malaise, and a temperature of 100·4° F. A slight tinge of jaundice was apparent. Although the liver edge was not palpable, Murphy's sign was positive. His urine was dark and contained bile, and the stools were pale, although not clay-coloured.

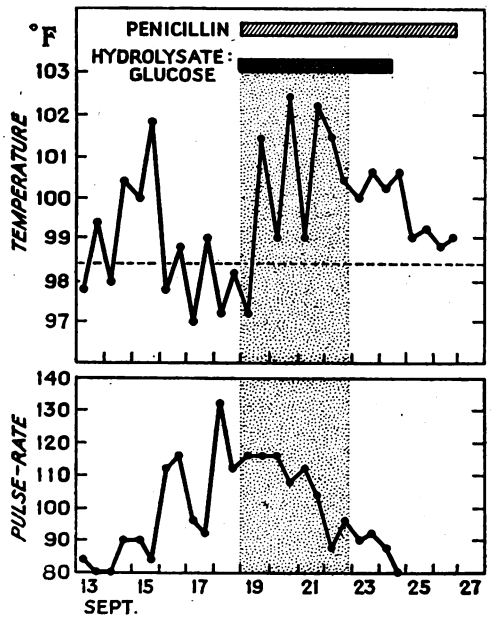
On the 16th anorexia was more severe and the jaundice a little deeper. He looked ill and vomited many times during the day. He was very tender over the right subcostal area. Leucin crystals were discovered in the urine. Next day the vomiting became more frequent, so that very little of what he took by mouth was retained. In the evening he had periods of drowsiness followed later by great restlessness and disorientation.

On the 18th he was very drowsy, the jaundice was a little deeper, the temperature subnormal, and the vomiting less frequent; the vomit consisted largely of dark blood. He was put on rectal glucose water. At 10 P.M. he lapsed into coma. His pupils were equal and dilated and did not react to light. Plantar responses were flexor. Breathing was quiet and regular. Glucose saline was started intravenously.

Next day he was very restless and had well-marked jactitations of one arm; for this he was given 20 c.cm. of 10% calcium gluconate intravenously and after this was quieter. To prevent a recurrence of bronchopneumonia a prophylactic course of systemic penicillin was begun, and in the evening treatment with a 5% solution of casein hydrolysates was started. The hydrolysates were given intravenously at the rate of 40 drops a minute. Each pint was alternated with 500 c.cm. of glucose solution given in distilled water or in normal saline, according to the chloride output in the urine.

On the 21st thrombophlebitis of the left saphenous vein developed, and the drip was accordingly changed to the other leg. Next day the depth of coma became progressively lighter, and at 11 P.M. the patient regained consciousness. He had been unconscious for 97 hours and had appeared desperately ill. On the morrow glucose was taken readily by mouth while the intravenous feeding continued.

On the 24th tenderness was no longer present in the right subcostal area. Since thrombophlebitis was starting in the second leg, intravenous therapy was discontinued. He had received intravenously 7 pints of a 5% solution of casein hydrolysates, 2·5 litres of a 10% glucose solution, and 3 litres of 5% glucose, and had taken 93 g. of glucose by mouth—a total of 180 g. of protein (720 calories) and 493 g. of glucose



(2020 calories) between 10 P.M. on Sept. 18 and 10 A.M. on Sept. 24. Henceforth he was given a high-protein, high-carbohydrate, and low-fat diet, and his jaundice became progressively less.

On Oct. 4 the icterus was minimal, and the serum bilirubin, which at the onset of the disease had been 10 mg. per 100 c.cm., rising to 20 mg. during coma, had fallen to 5 mg. per 100 c.cm. The urine for the first time was free from bile. The patient both looked and felt well.

The liver was never palpable, but before the onset of coma the area of right subcostal tenderness, obviously of hepatic origin, extended to the level of the umbilicus. On Sept. 26 a lævulose-tolerance test was performed, and the result was within normal limits. The periods of intravenous and penicillin therapy in relation to the period of coma are indicated on the accompanying chart.

The results of laboratory investigations were as follows:

Urine Reports

Sept. 16.—Albumin trace, bile +, leucine crystals present, Hay's test negative.

Sept. 18.—Albumin trace, bile +, no bile salts found.

Sept. 20.—Bile + +, bile salts +, Hay's test positive, granular and cellular casts and leucine crystals present.

Sept. 27.—Bile + + +, bile salts +, Hay's test positive.

Sept. 28.—Bile + + +, Hay's test positive, no albumin, a few pus cells, hyaline and cellular casts, occasional red cells and epithelial cells, no leucine crystals.

Oct. 1 and 2.—Bile +, no bile salts.

Oct. 4.—No albumin, bile pigments, or bile salts; only a few leucocytes and epithelial cells.

Serum Bilirubin (per 100 c.cm.)

Sept. 18	..	10 mg.	Sept. 29	..	8 mg.
Sept. 20	..	20 mg.	Oct. 4	..	5 mg.
Sept. 24	..	20 mg.			

White-cell Count (per c.mm.)

Sept. 18	..	20,000	Sept. 22	..	8000
Sept. 19	..	22,000			

Blood-urea (per 100 c.cm.)

Sept. 19	..	40 mg.	Sept. 29	..	25 mg.
Sept. 21	..	45 mg.			

DISCUSSION

Ætiology.—Himsworth and Glynn (1944) point out that experimental necrosis of the liver can be produced in two ways: by certain poisons of chemical or vital

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origin, or by lack of a nutritive factor contained in protein. They suggest that the former group should be labelled "toxipathic" hepatitis and the latter "trophopathic" hepatitis. They say that association of two or more weak toxipathic agents may produce a high incidence of severe hepatitis.

In the present case there are two possible toxipathic agents: the transfusion 94 days earlier, and contact with a case of infective hepatitis. A trophopathic factor also may have been operating, since the patient had had a poor appetite since his admission to hospital and was recovering from a fractured femur. Cuthbertson (1945) states that the negative nitrogen balance in the first ten days after a fracture of the leg might amount to some 860 g. of protein or 8% of the total body protein. The increased katabolic processes appear to arise out of a raiding of the body-protein reserves for an endogenous supply of amino-acids for the reparative process.

Thrombophlebitis.—The fact that thrombophlebitis developed in each of the injected veins in our case may be significant in view of the present-day experience of the Americans in the use of protein hydrolysates. In the earlier American papers there is frequent mention of thrombophlebitis, but recently such a reference is rare. Davis (1945) has reported the successful treatment of 203 patients after severe abdominal operations. He gave his patients 2 litres of a 5% solution of 'Amigen' (enzymic digest of casein) besides glucose daily for several days after operation. Brunschwig et al. (1945) kept alive for eight weeks a patient, aged 50, who had undergone two severe operations. During this time he received intravenously amigen, dextrose, and saline solution. Five blood-transfusions totalling 3600 c.cm. were given. No food was ingested by mouth. Neither of these reports mentions anything about thrombophlebitis. H. E. Magee (personal communication) states that thrombophlebitis almost always follows the use of any of the protein hydrolysates so far made in this country. This is unfortunate, because the American experience indicates a wide and fruitful field for suitable hydrolysates.

Without a biopsy the nature of the liver damage in this case must remain undecided. Clinically it closely resembled an acute necrosis of the liver. Dible and others (1943) have demonstrated by means of liver punctures that there is but a fine dividing line between a severe diffuse hepatitis and acute necrosis. They have shown that, when the progress of the disease is protracted, fibrotic changes may be produced, instead of complete restitution of the liver, and the classical picture of cirrhosis may develop. In the present case the postnecrotic scarring will either resolve or progress to nodular hyperplasia, and an enlarged and scarred liver should develop within the next two or three years; an enlarging spleen may be the first sign of such an event. Three months after his acute illness there was no evidence of liver damage and the patient was very fit.

SUMMARY

An apparently moribund patient with acute liver damage was in coma for 97 hours. During this time he received intravenous glucose and protein hydrolysates. It is suggested that the circulating nutriment in the liver materially helped the hepatic cells to regenerate functionally and possibly also anatomically. Penicillin was given as a prophylactic measure against pneumonia; the possibility that it played a part in combating the liver infection cannot be excluded.

We are grateful to Dr. R. Miller, medical director, for his help in the management of this case, and to Dr. H. E. Magee, of the Ministry of Health, who kindly provided us with much information about protein hydrolysates. We also thank the pathological staff for their help, and Mr. V. H. Ellis, under whose care the patient was admitted, for permission to publish the case.

References at foot of next column

TOXICITY OF MARFANIL AND V187 TO CELLS IN VITRO

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Illustrations on plate

IN previous investigations on the toxicity of sulphonamides to somatic cells cultured in vitro (Jacoby et al. 1941, Jacoby 1945) only such compounds were tested which, under certain conditions, are known to be antagonised by *p*-aminobenzoic acid. In these studies it was found that, even with the most toxic ones—i.e., sulphanilamide and sulphaguanidine—a fair amount of growth took place at a drug concentration of 100 mg. per 100 c.cm. The following experiments were designed to compare the above-mentioned findings with the action of those sulphone-compounds, such as 'Marfanil,' which are said not to be antagonised in vitro by *p*-aminobenzoic acid (Link 1943), pus, or other tissue breakdown products. The fundamental question to be answered was: does the greater bacteriostatic and bactericidal effectiveness of these new compounds go parallel with greater toxicity to somatic cells, especially to cell types which play an important part in the physiology of wounds? For, as previously, these studies were undertaken in relation to local drug application. Questions of general toxicity, therefore, are outside the scope of this paper.

Interest has been focused on these new compounds, particularly by the recent work of Evans et al. (1944), who demonstrated a very potent local chemotherapeutic action of marfanil and several other compounds related to it in experimental gas-gangrene infections in guinea-pigs. They also showed that one of these substances, 'V187' (*p*-methylsulphonylbenzamidine hydrochloride), was in vitro and in mice as effective against sulphanilamide-resistant streptococci as it was against a sulphanilamide-sensitive strain.

METHOD

In the tissue-culture experiments to be reported here only marfanil and V187 were tested, and the cells used were (1) pure populations of macrophages derived from hen's blood and grown in Carrel flasks according to Baker's (1933) technique—i.e., fed at intervals of 3–4 days with hen blood-serum diluted with Tyrode's solution—and (2) a strain of so-called fibroblast colonies originally derived from the periosteum of a frontal bone of a chick embryo 11 days old. The strain was carried through more than ten passages on coverslips in a mixture, 1:1, of hen blood-plasma and chick-embryo extract before a set of cultures was used for an experiment. The strain then showed a high degree of uniformity. Only cultures were used which could be halved, and the two halves of a colony were, in many instances, placed into different drug concentrations (including zero drug = control), so that by following the fate of such pairs the average group response received an additional check. In fig. 1 only the group responses are represented, though the differences of effects were often more striking in individual culture pairs.

The respective drug dissolved in Tyrode's solution was added, in the case of macrophage cultures, to hen blood-

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serum, and, for the fibroblast cultures, was mixed with hen blood-plasma so as to give the desired final concentrations. With fibroblasts the plasma used for the controls was similarly diluted with Tyrode's solution. As the main aim was merely to determine the approximate minimal lethal concentrations and grossly inhibitory doses of the two drugs, rough estimates of the effects were made, in the case of macrophages, after 20 hours' drug treatment, from the morphological appearance of the cells together with recovery tests in fresh serum; in the case of fibroblasts, area measurements of the cultures were made on four successive days, the morphology of the cells recorded, and special attention paid to the presence or absence of mitoses. In some instances recovery tests were also made by transferring such fibroblast cultures which appeared strongly inhibited and damaged (rounding-off and fragmentation of cells) to a fresh plasma-extract medium. Though a quantitative study of the rate of cell division was not undertaken with either cell type, the data obtained can be regarded as sufficient for the evaluation of the range of toxicity of the two drugs and suitable for comparison with previous experiences with the other sulphonamide compounds.

RESULTS

The results are set out in the table and figures, which show that a final concentration of 100 mg. per 100 c.cm. of either drug, when applied for 20 hours to macrophages, is invariably lethal. Some of the fibroblast cultures, exposed to such a concentration for four days, degenerated completely and could not be "revived" by subsequent transplantation; others recovered in a fresh medium, particularly from V187, less from marfanil. In lower concentrations (20–50 mg. per 100 c.cm.) of drug the macrophages were still strongly inhibited, rounded off, granulated, and fatty (fig. 2 *a*, *c*, *e*). Recovery, however, complete or partial, was possible in most cases in fresh drug-free serum (fig. 2 *b*, *d*, *f*). Again marfanil appeared to be slightly more toxic than V187. Though fibroblast cultures growing in a similar drug concentration (20 mg. per 100 c.cm.) attained, by means of outward migration of the cells from the transplant, fair sizes almost equal to those of controls, they showed much vacuolisation and accumulation of fat, indicating impaired health, and hardly any mitoses were seen. Cells living in a concentration of 10 mg. per 100 c.cm. of these drugs

EFFECTS OF MARFANIL AND V187 ON HEN BLOOD MACROPHAGES

Final concentration of drug in 40 % serum (mg. per 100 c.cm.)	Marfanil		V187	
	Cells after 20 hours	Recovery in fresh serum	Cells after 20 hours	Recovery in fresh serum
1000	Killed*	–	..	..
100	Killed*	–	Killed*	–
50	Gross inhibition*	±	Much inhibition†	+
20	Much inhibition†	+	Some inhibition†	+
10	Little affected	+	Very little inhibited	+

* Cells round off within a few minutes after the application of the drug-containing serum.
† Rounding-off is delayed and some cells remain amœboid.

appeared on the whole to deviate little in morphology and mitotic activity from those of controls. Some macrophage cultures were kept for two or three days in this drug concentration, during which period many cells were seen to divide, while others appeared still somewhat inhibited. That, in view of all the results, fibroblasts appear slightly more resistant to these drugs is probably entirely due to the necessarily different culture technique.

DISCUSSION

It can be inferred from these tests that under the conditions of these experiments the minimal lethal concentration for marfanil and V187 is probably slightly less than 100 mg. per 100 c.cm. This stands in striking contrast to the results obtained with the older members of sulphonamide compounds, where such concentration would permit of substantial growth. Again, inhibition is still obvious in a drug concentration of 20 mg. per 100 c.cm. and in some instances was not entirely absent even at 10 mg. per 100 c.cm., concentrations which with the older sulphonamides were practically without any effect on growth and morphology of the cultured cells.

Whether this difference in toxicity is due to the fact that the two new compounds are not antagonised by *p*-aminobenzoic acid seems at the present state of tissue-

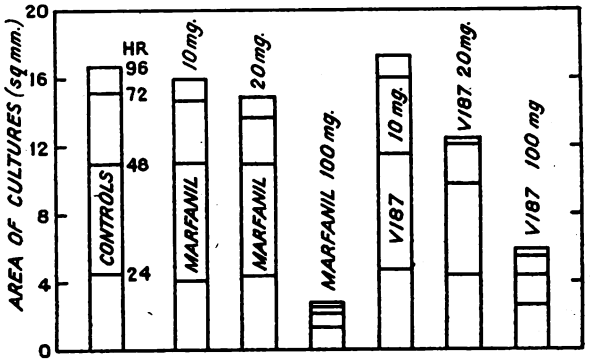

Fig. 1—Effects of marfanil and V187 on growth in area of so-called pure cultures of periosteal fibroblasts, derived from a chick embryo (passage cultures) grown on coverslips in a mixture of hen plasma and chick-embryo extract. Horizontal lines indicate sizes attained after 24, 48, 72, and 96 hours respectively. Each column represents the mean of at least ten cultures. (Concentrations per 100 c.cm.) See also text for morphological details.

culture technique—i.e., in the absence of synthetic media—impossible to decide. This property of not being antagonised by *p*-aminobenzoic acid, at any rate in vitro, depends very likely on the fundamentally different molecular configuration of these new compounds as compared with that of the older sulphonamides. And it is this different molecular configuration which must in some way determine the greater toxicity and bacteriostatic effectiveness of marfanil and V187.

Attention should also be drawn to their great solubility, which is more than ten times that of even sulphanilamide. Previously it had been found that the toxicity of sulphanilamide, sulphaguanidine, sulphathiazole, sulphadiazine, and sulphapyridine roughly paralleled their solubility. The present work shows marfanil slightly but definitely more toxic than V187; again, marfanil is about twice as soluble as V187. Though it cannot be stated in what way increased toxicity is linked with greater solubility, it is conceivable that the ease and speed with which an individual compound can penetrate into the cytoplasm of a cell might be correlated to its solubility.

Mitchell et al. (1944), who reported good results in the treatment of wounds by local application of marfanil, state that the efficiency of this drug is second only to that of penicillin. A brief comparison of the toxicity of penicillin to cells cultured in vitro with that of marfanil and V187 described here seems, therefore, of interest. Medawar (1941) in his standardised tissue-culture tests found the minimal lethal dosage of penicillin for fibroblasts to be of the order of 70 mg. per 100 c.cm., whilst Jacoby (see Abraham et al. 1941) recorded complete, though still reversible, inhibition of multiplication of macrophages only in a penicillin concentration of 500 mg. per 100 c.cm. These tests, made with a purified sample of penicillin as supplied by the Oxford team in 1941, show that, at that stage of purification, the toxicity of penicillin to fibroblast, at any rate, was of a similar order of magnitude as that described here for marfanil and V187, though it was decidedly less in the tests carried out with macrophages. But the great difference lies in the amplitude between this dose, severely toxic to body-cells, and the minimal bacteriostatically effective dosage, which is relatively narrow for the sulphone compounds (cf.

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Zeissler 1944), but of considerable width in the case of penicillin (Abraham et al. 1941) which makes the latter substance so infinitely superior.

It might be argued that these tests executed on chicken-cells in chicken media represent rather a restricted case, and that the results may not be applicable to other species, particularly the human. It is doubtful whether this argument holds, at any rate for these types of cultured cells. In considering some of the published data bearing on this question, one has to make allowance for the considerable variations in culture techniques used in different laboratories. Medawar (1941) found rat epithelia to behave similarly to chick epithelia when exposed to various sulphonamides. Reed et al. (1942), studying the effects of sulphathiazole in cultures of fibroblasts from guineapigs, obtained results of a similar order of magnitude as those recorded for chick fibroblasts by other workers. The same applies to Osgood's (1942) work on cultured human bone-marrow cells. Abraham et al. (1941) observed in short-time experiments the amœboid activity of human leucocytes in dilute serum to which various drugs used in chemotherapy had been added. Their results on the toxicity of penicillin, for instance, accord fairly well with my own observation for this drug on hen blood macrophages. As regards marfanil and V187, Evans et al. (1944) used the same technique as the Oxford penicillin workers for tests on leucocytes, though they did not state the species (presumably human). They found immobilisation of most cells in an hour in a drug concentration of 1000 mg. per 100 c.cm. for V187 and of 500 mg. per 100 c.cm. for marfanil.

It is not denied that carefully planned and truly comparable tissue-culture studies, in which the same cell types from different animals are used for such drug tests, might reveal some (probably minor) species differences, but such comparative studies do not seem to exist. The available data, however, appear more to point in the direction of general similarities in the behaviour of cultured cells derived from different species. The well-known different susceptibilities of different animals to the toxic effects of such drugs, as considered here, lie on a different plane and depend probably on differences of detoxicating and other metabolic mechanisms in which the organism as a whole (or certain organs, such as the liver) are involved rather than the cells in wound surfaces exposed to these drugs.

From the practical point of view—i.e., in the light of local chemotherapy—initial damage to the somatic cells of wound surfaces cannot be excluded if the two drugs—i.e., marfanil and V187—are used, as they should be, in very high concentration, though it should be remembered that in infected wounds the cell death-rate is, in any case, very high, and the surfaces are often covered with more or less necrotic tissue material which may act as a kind of "shock absorber" against such very high concentrations of drug.

It must also be remembered that the conditions of these in-vitro tests are more severe than those prevailing in an organism where the drugs—if, say, inserted in a wound—will be more or less quickly diluted, absorbed, and carried away in the blood-stream, facts which will all tend to lessen the degree and time of exposure of the local cells to the injurious influences of the drugs. Particularly will this be the case with these highly soluble new compounds. Above all it is the prevention of infection or of its spread and the sterilisation of wounds which are the primary purposes of local drug application; and these must, and can safely, receive first consideration if the use of such drugs as marfanil and V187 is otherwise indicated.

SUMMARY

The toxicity of marfanil and V187 was tested in vitro on cultures of hen blood macrophages and embryonic chick fibroblasts.

The minimal lethal dosage, under the conditions specified, is somewhat less than 100 mg. per 100 c.cm.; inhibition is still conspicuous in a concentration of 20 mg. per 100 c.cm.; in a concentration of 10 mg. per 100 c.cm. the cells deviate but little from the controls.

Marfanil appears to be slightly more toxic than V187.

The results are compared with those obtained previously with other sulphonamides and with penicillin.

I wish to thank Dr. Leonard Colebrook, who suggested these investigations; Mr. W. Short, of Boots Ltd., for the supply of marfanil; and Dr. J. Walker, of the National Institute for Medical Research, Hampstead, for the supply of V187.

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TUBERCULOUS LOBAR PNEUMONIA TREATED BY PNEUMOPERITONEUM AND PHRENIC CRUSH

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Illustrations on plate

TUBERCULOUS lobar pneumonia is notoriously fatal, and its control by pneumothorax is always hazardous, because pleural reactions are frequent, and tuberculous empyema is a common sequel. It is therefore worth while to record the effective treatment of two patients with tuberculous lobar pneumonia by pneumoperitoneum and phrenic crush.

CASE 1.—A female shorthand typist, aged 19, was admitted to University College Hospital on Nov. 20, 1944, with a history that four weeks previously she had felt unwell, and a few days later had taken to her bed with a temperature of

LEGENDS TO ILLUSTRATIONS ON PLATE

DR. JACOBY

Fig. 2—Photomicrographs showing effects of marfanil and V187 on hen blood macrophages in vitro (×153): (*a*) macrophages 20 hours after application of V187 (50 mg. per 100 c.cm. in 40% serum), cells round and full of fat granules; (*b*) same culture (same field) 24 hours after removal of drug and now in fresh serum, recovery well advanced but not yet complete, and increase of population; (*c*) macrophages 20 hours after application of marfanil (20 mg. per 100 c.cm. in 40% serum), many cells rounded off, others still amœboid, all full of fat droplets; (*d*) same culture (slightly different field) 24 hours after removal of drug and now in fresh serum, most of cells now amœboid, and fat content much decreased; (*e*) macrophages 20 hours after application of marfanil (50 mg. per 100 c.cm. in 40% serum), extreme rounding-off, clumping, fat accumulation, and unusual vacuolisation (a degree of injury not often seen in these tests); (*f*) same culture (same field) 24 hours after removal of drug and now in fresh serum, definite improvement in cell morphology, cells have spread out and started to migrate, but still contain much fat (this culture did not recover completely).

DR. WADE

Fig. 1—Radiogram showing dense opacity over whole of left lung field (case 1, Nov. 20, 1944).

Fig. 2—Effect of pneumoperitoneum and phrenic crush (case 1, Dec. 17, 1944).

Fig. 3—Effect of artificial pneumothorax after abandonment of pneumoperitoneum (case 1).

Fig. 4—Initial lesion at base of right lung, with commencing cavitation (case 2, June 29, 1945).

Fig. 5—Effect of pneumoperitoneum and phrenic crush (case 2, July 16, 1945).

Fig. 6—Satisfactory collapse of lung produced by pneumoperitoneum and phrenic crush (case 2, Oct. 3, 1945).

DR. PREISKEL

Radiogram of œsophagus after barium swallow, showing crater of ulcer about 2 in. above cardia, with tortuous sinus running downwards and outwards into mediastinum.

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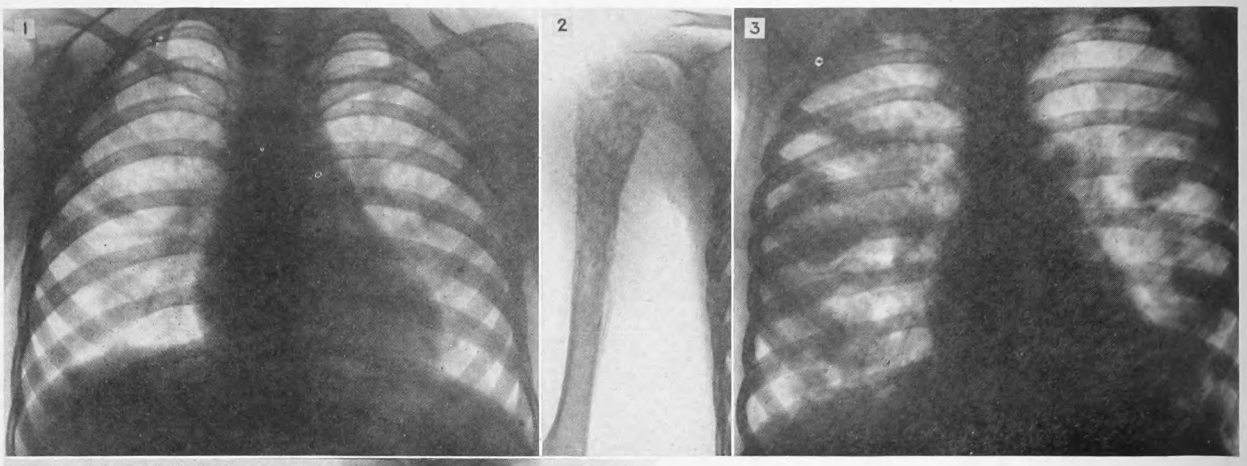
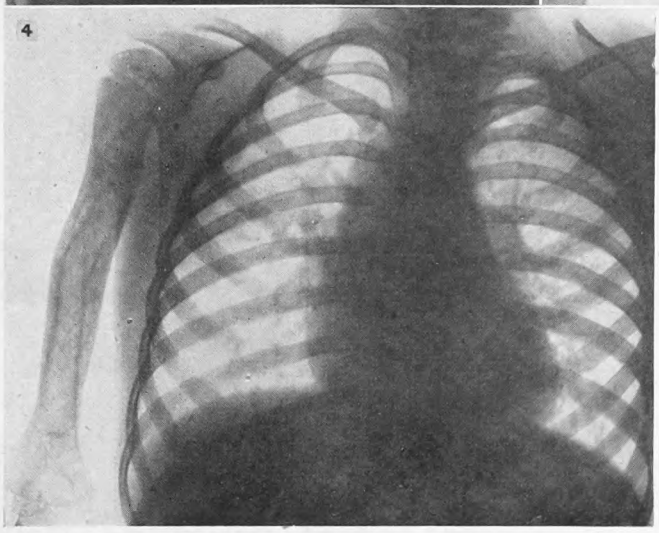
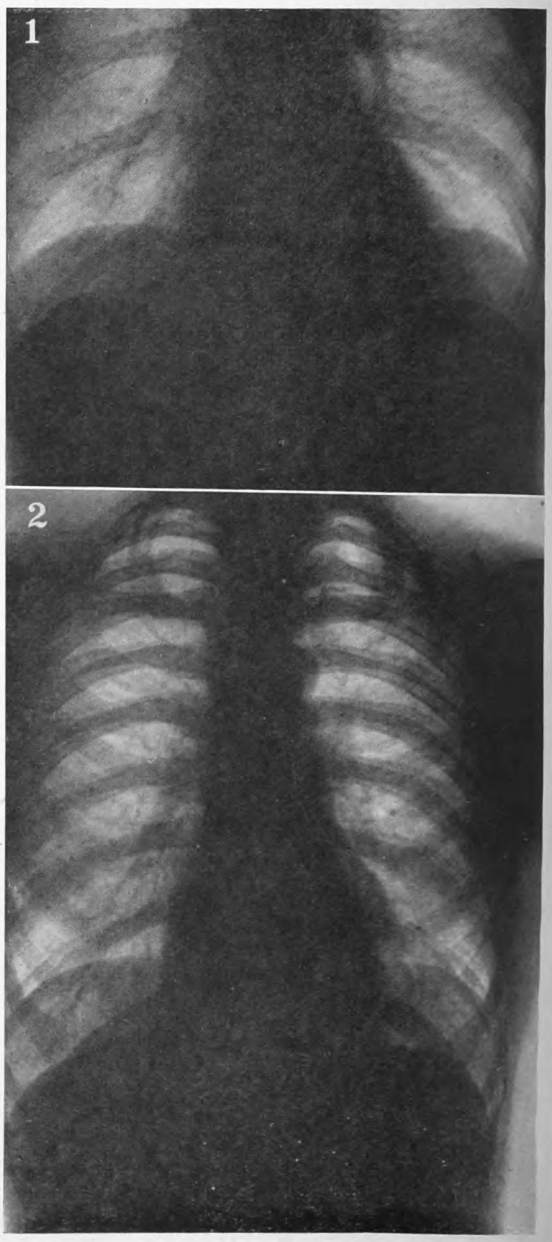
DR. BRAILSFORD : OSTEOMYELITIS RESEMBLING SARCOMA

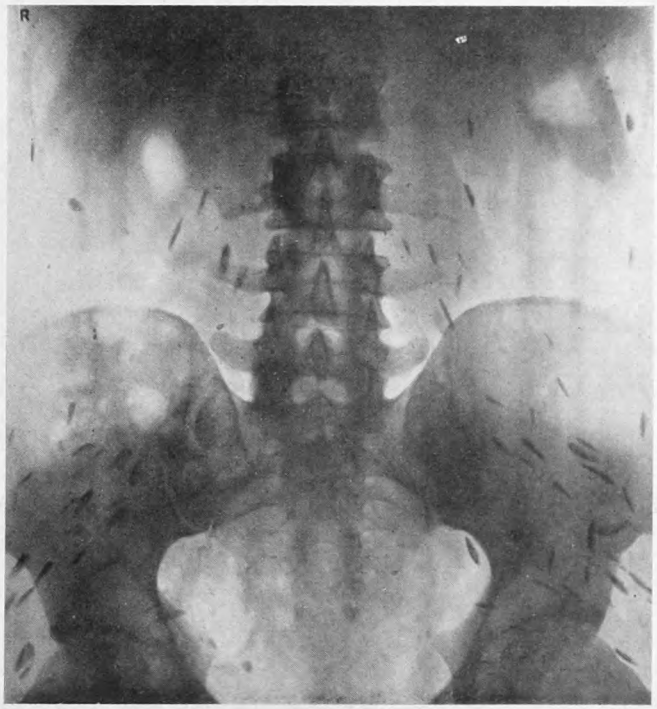




DR. MAXWELL : DOUBLE-EXPOSURE RADIOGRAMS OF CHEST



DR. EDWARDS : CEREBRAL CYSTICERCOSIS



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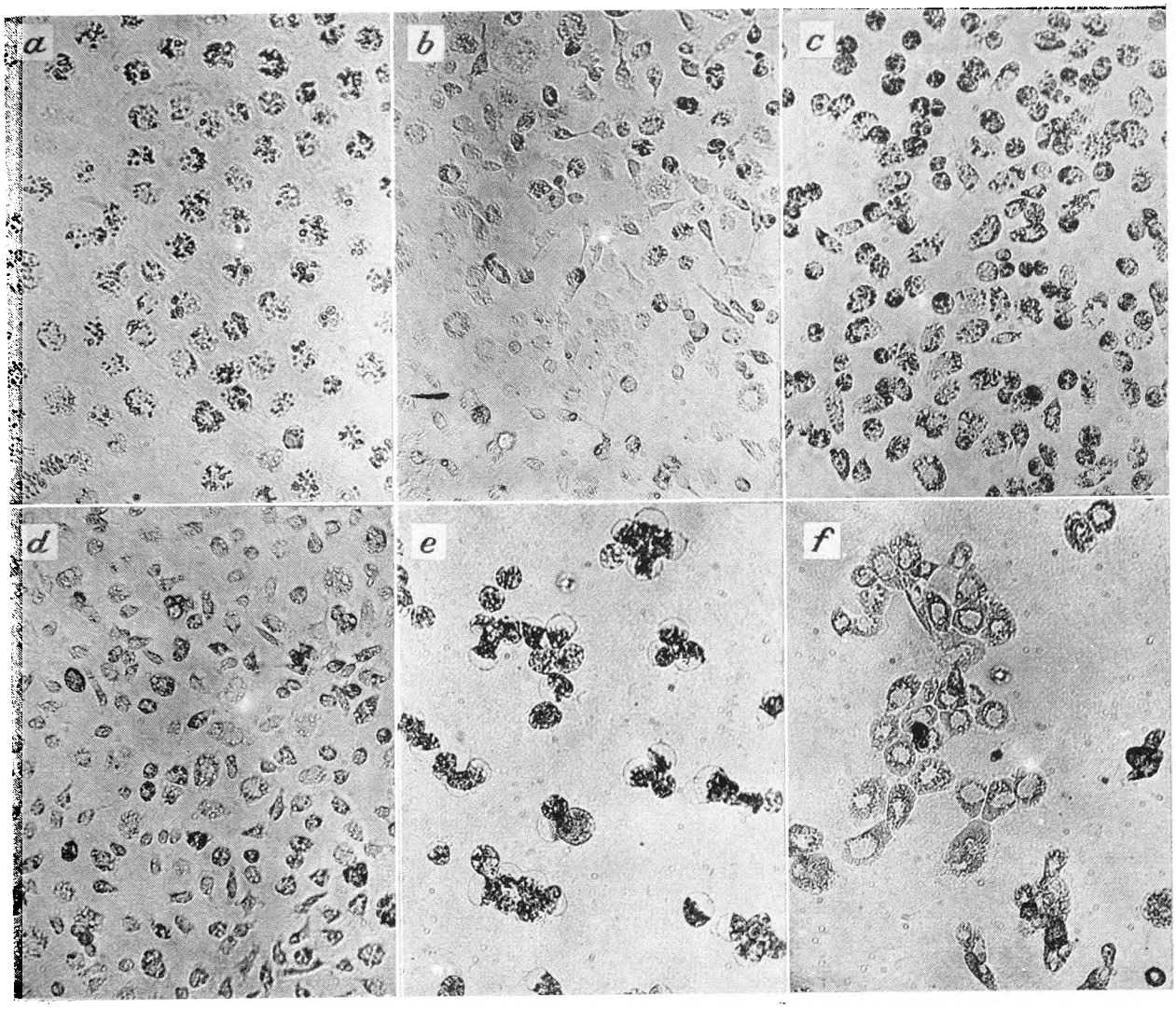
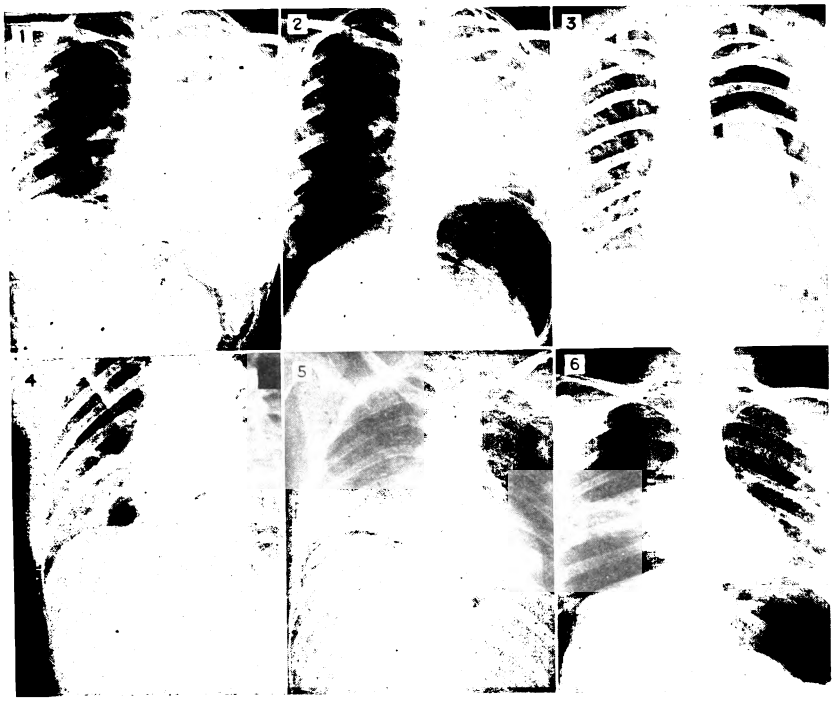
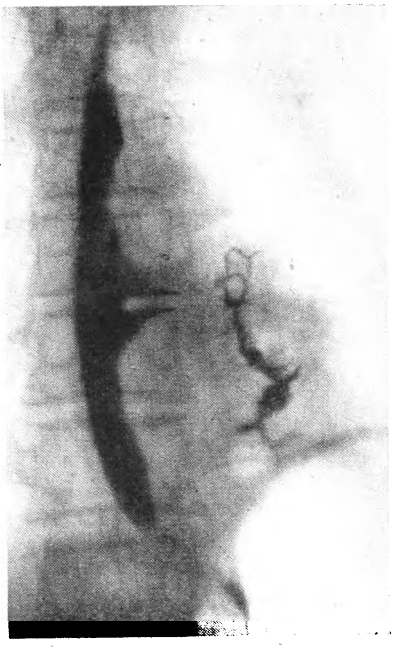
DR. JACOBY: TOXICITY OF MARFANIL AND V187 TO CELLS IN VITRO



DR. WADE: TUBERCULOUS LOBAR PNEUMONIA



DR. PREISKEL: PERFORATED ŒSOPHAGEAL ULCER



102° F. A week later pneumonia was diagnosed and sulphonamide treatment started, to which she did not respond.

On admission she was extremely pale; there was no dyspnœa, but she had a frequent tiresome cough. Temperature 100°–102° F, respirations 20–28 per min. There was no displacement of the mediastinum, but there was well-marked impairment of percussion at the left apex; and, though the air entry was reduced, the breath-sounds were harsh and bronchial. Anteroposterior radiograms of the chest showed a dense opacity over the whole of the left lung field (fig. 1), which a lateral view showed was almost limited to the upper lobe of the lung. A blood-count showed no leucocytosis. No tubercle bacilli could be found in the sputum, but there was little doubt that this was a case of tuberculous lobar pneumonia, and collapse therapy was strongly indicated.

On the evening of Nov. 20 a phrenic crush was performed, and next day a pneumoperitoneum was induced, 2000 c.cm. of air being given (fig. 2). A refill of 500 c.cm. was given next day, and on the 24th another 900 c.cm. was introduced. Although the physical signs at the left apex showed little change, the patient's general condition improved greatly, and her temperature fell to below 100° F and the sedimentation-rate to 24 mm. in the first hour by the end of the first week in December.

The pneumoperitoneum was maintained until March, 1945, when a left pneumothorax was induced and the pneumoperitoneum abandoned. The temperature and pulse-rate were steady, the blood-sedimentation rate became steadily lower, her weight increased, and she felt remarkably fit. In May an adhesion holding up the apex of the collapsed lung was cut, and in June the patient was transferred to a sanatorium. She has since been discharged and attends as an outpatient for pneumothorax refills; she is in very good health and has married. The present condition of the lung, with pneumothorax, is shown in fig. 3.

CASE 2.—A student nurse, aged 22, a native of Western Ireland, came to England three years ago to train as a nurse. She had never had any severe illness, and there was no family history of tuberculosis, but she had been in contact with open cases during her training. A chest radiogram taken as a routine in August, 1944, showed no sign of pulmonary disease.

On June 22, 1945, she fell asleep in the sun and awoke to find herself sweating profusely; she felt as if she had a cold in the head, and her chest felt a little tight. She did not report the trouble but returned to duty until the 27th, when she felt too ill to continue and was warded.

Physical examination showed only impaired percussion at the right base, but next morning tubular breathing and many crepitations could be heard. Radiography confirmed that there was consolidation at the right base.

On the 29th her temperature was 104° F, respirations 30 and pulse-rate 112 per min. A course of sulphathiazole was started, and the temperature was down by the evening but rose again to 104° F next day and on subsequent days. By July 2 she was looking very poorly and slightly cyanosed. For the first time a specimen of sputum was obtained and found to contain many tubercle bacilli. The sulphathiazole was discontinued.

Radiography on June 29 had shown the beginning of cavitation at the right base (fig. 4), and by July 2 this had progressed so rapidly that the radiologist thought the appearances consistent with those of a simple lung abscess.

On the 6th the patient was transferred to University College Hospital. On admission the temperature was 101·8° F and respirations 35 per min., with slight dyspnœa. She had no cough or pain. Movement of the right side of the chest was restricted, the percussion note at the right base was impaired, and tubular breathing, crepitations, and rhonchi were heard over the same area. The sputum showed numerous tubercle bacilli; the sedimentation-rate was 30 mm. in the first hour; a blood-count showed no leucocytosis (7100 white cells per c.mm.).

Tuberculous lobar pneumonia was diagnosed, and it was decided that collapse therapy should be instituted. On the 7th a pneumoperitoneum was induced with an A.P. induction needle, 500 c.cm. of air being introduced without difficulty. Next day a refill of 400 c.cm. was given, and on the 9th another 700 c.cm. On the 10th the right phrenic nerve was crushed under local anæsthesia. Next day another refill of 900 c.cm. was introduced, and on the 16th radiography showed that the right side of the diaphragm was paralysed and elevated, giving good collapse of the right lower lobe; there was no evidence of a cavity (fig. 5). Tubercle bacilli could not be found in a specimen of sputum taken on the 21st, and have not been found in any subsequent specimen.

On the 22nd venous thrombosis developed in the right leg, which became swollen and œdematous and was very painful for a few days. Although passive movements of the limbs were started, thrombosis developed in the left leg three weeks later, and at the same time the patient had a sharp pain in the left side of the chest, where a pleural friction rub could be clearly heard for seven or eight days.

By the end of September the patient's general condition had greatly improved. Her temperature was steady, always less than 100° F and usually below 99° F. Refills to the pneumoperitoneum were given weekly, usually 1000 c.cm. By October her temperature had been below 99° F for a month, her sputum was repeatedly negative, her sedimentation-rate was 4 mm. in the first hour, and her latest radiogram showed very satisfactory collapse of the lower lobe of the right lung (fig. 6). Her colour had returned, she was bright and cheerful, was out-of-doors by day and night, and her one complaint was that she was confined to strict rest in bed.

SUMMARY

Two cases of tuberculous lobar pneumonia are described, in both of which the patients were seriously ill and collapse therapy was strongly indicated.

In case 1 a pneumoperitoneum and a phrenic crush gave sufficient collapse of the diseased lung for the patient's general condition to improve, so that later it was possible to institute a pneumothorax without the danger of complications.

In case 2 a pneumoperitoneum and a phrenic crush immediately collapsed a diseased lower lobe, and this collapse has proved so successful that it is unlikely that further measures will be necessary.

I wish to thank Dr. Andrew Morland for permission to publish these two cases; the patients were admitted to hospital under his care, and the treatment was under his direction.

PEPTIC ŒSOPHAGEAL ULCER

NON-FATAL PERFORATION

ELLA PREISKEL

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Illustration on plate

SIMPLE ulceration of the œsophagus was first described by Albers in 1833. In 1879 Quincke showed histologically that these ulcers resembled peptic gastroduodenal ulcers. Tileston (1906), in his classical description of the condition, records 44 cases, in all of which the ulceration was confined to the lower end of the œsophagus.

Various complications have been described, the most important being perforation, hæmorrhage, and carcinomatous change (ulcer-cancer). An important sequela is stenosis.

In Tileston's series perforation occurred in 6 cases, all of them fatal. He differentiates between perforation above and below the diaphragm—the former into pleural cavities, pericardium, aorta or other large vessel, lung,

LEGENDS TO ILLUSTRATIONS ON PLATE

DR. BRAILSFORD

Figs. 1 and 2—Radiograms of chest and upper arm on Nov. 10, 1944.

Fig. 3—Chest on Jan. 4, 1945, showing increase in size and density of lesions.

Fig. 4—Chest and upper arm on May 10, 1945, showing sound consolidation of humerus and disappearance of lesions from lungs.

DR. MAXWELL

Fig. 1—Double-exposure radiogram showing positions of diaphragm on maximal expiration and inspiration.

Fig. 2—Double-exposure radiogram showing positions of diaphragm and ribs on maximal expiration and inspiration.

DR. EDWARDS

Radiogram of cysticerci distributed mainly along muscle planes.

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bronchus, or mediastinum; the latter into the general peritoneal cavity or the lesser sac. He mentions that the only non-fatal cases recorded have been those perforating below the diaphragm. Similar infradiaphragmatic perforations have been described by Huwald (1893), Winkler (1908), and Sencert (1911). Descriptions of perforation into the thoracic viscera and mediastinum are not uncommon, but no case of survival appears to have been recorded. The case reported here is one of perforation of a peptic œsophageal ulcer into the mediastinum, with survival.

CASE-RECORD

An Italian prisoner-of-war, aged 31, was admitted to an E.M.S. hospital on May 21, 1945. Apart from malaria, his medical history had been uneventful until 1935, when he developed pain in the left side of the chest and brought up a small quantity of blood, which he thought he had coughed up. He was kept in hospital for seven months, with a diagnosis of left basal pleurisy. After radiography of his chest, he was told that the blood was coming from the throat, not the lungs. Later, when bleeding was unquestionably œsophageal, it nevertheless gave him a sensation of being coughed up.

The only relevant family history was that a brother died of pulmonary tuberculosis in 1937.

While recovering from the so-called pleurisy, the patient noticed a tendency to vomit if he lay on his left side, and he also began to have periodic bouts of heartburn and a sensation of arrest of solids behind the lower part of the sternum. These dyspeptic bouts lasted 1–2 weeks. The pain would come on 1–2 hours after a meal and was relieved by food.

During the next nine years the dyspepsia continued, the bouts recurring every 6–10 months, and there was another episode of bringing up blood. In June, 1944, the pain became much more intense, though its relation to food was unchanged. It attained its climax in July, 1944, when he suddenly brought up 200 c.cm. of dark altered blood. He localised the pain as behind the lower third of the sternum and slightly to the left of the midline.

Since this episode he had never felt really well. The dyspepsia had been almost continuous, and he had lost a considerable amount of weight. In May, 1945, a further hæmorrhage led to his admission to hospital. He said he had never drunk any corrosive fluid.

On admission there were no physical signs apart from slight pallor of the mucosæ. His general physique was poor. He was still bringing up blood-stained mucus.

Radiography of chest: left diaphragm slightly raised; no pleural thickening; root shadows slightly increased; no lesion in lung fields. Sputum: no acid-fast bacilli found. Hæmoglobin 80%. Wassermann reaction negative.

Barium swallow (June 2): œsophagus of normal length and position. About 2 in. above the cardia there was a large irregular crater on the left wall of the œsophagus, and from this crater a tortuous sinus ran downwards and outwards into the mediastinum (see figure). The sinus filled readily with barium, but no communication could be established with any other viscus. Above and below the crater the œsophagus was normal. No communication with the trachea or bronchi was seen.

Barium meal: stomach and duodenum normal; no diaphragmatic hernia seen.

Fractional test meal (June 14): extremely high sustained acid curve, with blood present in practically all specimens.

The patient was put on a strict peptic-ulcer regime, with well-marked alleviation of symptoms. On June 22nd, however, he had another fairly profuse hæmatemesis. This was followed by an exacerbation of the dyspepsia, which again responded to treatment. A barium meal on Sept. 6 showed no change in the ulcer or the sinus.

Œsophagoscopy, performed on Oct. 16, showed the œsophagus to be normal in its upper two-thirds. The lumen was slightly narrowed 4 in. from the diaphragmatic orifice, as if by muscular hypertrophy, with a normal lining mucosa. Beyond this the œsophagus was a little dilated, and 2 in. above the cardiac orifice the opening of the track could be seen, with some barium still in it. The terminal mucosa was scarred, particularly in the region of the track, and presented the appearance of gastric rather than œsophageal mucosa.

DISCUSSION

The history is somewhat confused. In 1935, when he first brought up blood, he was told that the bleeding was not from the lung. Moreover, the bleeding coincided with the onset of the dyspeptic symptoms, of which a prominent feature, even now, is pain in the left side of the chest. It is reasonable to infer that he did not have pleurisy, and that the œsophageal ulceration began in 1935. There is no radiological evidence of any lung lesion either active or healed.

The diagnosis of peptic œsophageal ulcer in this case is based on the following evidence:

(1) Periodic dyspepsia, with the site of pain localised to the left of the lower end of the sternum.
(2) A sensation of arrest of food behind the lower end of the sternum.
(3) Hyperchlorhydria.
(4) Hæmatemesis.
(5) Radiological evidence of ulceration and perforation in the lower end of the œsophagus, with a normal œsophagus above and below this point.
(6) Visual evidence (on œsophagoscopy) of scarring round the orifice of the sinus.
(7) Alleviation of symptoms on a peptic-ulcer regime.

Chamberlin (1939) has laid down the following criteria for establishing the diagnosis of œsophageal peptic ulcer: the ulcer must be chronic; it must not be associated with any systemic disease; free hydrochloric acid must be present; the symptoms must be alleviated by therapy; and the ulcer must be seen on œsophagoscopy or at autopsy. All these criteria have therefore been fulfilled. How the patient has escaped a fatal mediastinitis in the past remains a mystery. At the time of writing he is practically symptom-free on a peptic-ulcer regime and has been discharged from hospital.

I wish to thank Dr. W. Stobie and Prof. L. J. Witts, who had this patient under their care at various times; Dr. D. T. Barnes, Dr. F. H. Kemp, and Dr. B. Mannheimer, of the radiological department, Radcliffe Infirmary, Oxford, for the X-ray data; and Major H. S. Sharpe, R.A.M.C., for performing the œsophagoscopy.

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OSTEOMYELITIS RADIOGRAPHICALLY RESEMBLING SARCOMA*

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Illustrations on plate

IN acute osteomyelitis there is a latent period of 7–14 days from the onset of clinical signs before radiography will show any change from the normal appearances. Such changes depend on the virulence of the organism and the resistance of the patient and can be influenced in some cases by the administration of sulphathiazole or penicillin, particularly if these are given early. In the aborted disease therefore the radiographic changes characteristic of the untreated disease do not develop.

In some cases the radiographic changes are slight, but in others they are indistinguishable from those due to sarcoma, as follows:

(1) Periosteal reaction, consisting of multiple linear accretions of new bone over the shaft at the site of the primary focus, which may be represented as a small ill-defined area of osteoporosis.
(2) The absorption of this new bone immediately over the focus, leaving a so-called periosteal cuff on the shaft adjacent.

* Extracted from a paper read at the British Institute of Radiology on May 18, 1945, on Signs of Malignancy in Bone Tumours.

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(3) Some increase in the density of the medulla, and masking of the detail of the cancellous tissue of the shaft, which appears to be due to filling in of the cancellous interstices with calcium.
(4) Some ill-defined calcium deposits in the adjacent soft tissues.

So alarming may these appearances be that precipitate surgery may be employed to the serious disadvantage or loss of the patient. If one knows the possibility of this and has made a careful study of the early history, including an account of the medicinal treatment given, uninterrupted and complete resolution may be secured by immobilisation without any surgical intervention. Biopsy may complicate the issue, particularly if the histological appearances are erroneously interpreted. The possibility of syphilis must be excluded.

I have been so impressed by these alarming radiographic appearances, the excellence of some of the results of non-intervention and immobilisation, the misleading histology of biopsy, and the very disappointing results of therapeutic irradiation and surgical amputation in sarcoma, that I have advised a preliminary course of sulphathiazole in doubtful cases and am satisfied that the results are worthy of further consideration and investigation. The following case illustrates a remarkable cure.

CASE-RECORD

A girl, aged 6 years, with a painful swelling over the right upper arm, had been kept under observation at a children's hospital for some weeks, during which her temperature was normal except for a rise to 99° F on four occasions; pulse-rate 90–100 per min. Blood count on Oct. 17, 1944, was: red cells 4,590,000 per c.mm.; colour-index 0·98; Hb 90%; platelets 286,666 per c.mm.; hæmatocrit 36·2%; mean cell volume 79%; reticulocytes 2·4%; white cells 10,375 per c.mm. (segmented neutrophil polymorphs 56%, non-segmented neutrophil polymorphs 0·5%, lymphocytes 36%, eosinophils 3·5%, basophils 0·5%, myelocytes 3·5%). She was ultimately discharged as incurable, the diagnosis being sarcoma with multiple metastases in the lungs. A second opinion was then sought from Mr. A. M. Hendry, who submitted the case to me for radiological examination and opinion. Radiograms (see figs. 1 and 2) were taken on Nov. 10, 1944, on which I reported as follows:—

"Marked changes in the upper half of the humeral shaft (diaphysis only), which has fractured. The disintegration of the bone and the periosteal reaction are indistinguishable from osteomyelitis, but there are multiple rounded secondary lesions in the lungs. These certainly suggest the diagnosis of sarcoma. In view of the hopelessness of any operative procedure, is there any use in administering sulphathiazole or its fellows in the hope that they are inflammatory secondaries?"

Mr. Hendry consented to my suggestion. He put the fractured arm in a short plaster and advised the administration of sulphathiazole (0·25 g.) every 4 hours for five weeks.

Subsequent clinical and radiographic examinations on Nov. 30, 1944, and Jan. 4, 1945, showed a progressive worsening of the signs. The radiogram of Jan. 4 (fig. 3) showed further disintegration of the upper half of the humerus and progressive development of the multiple rounded lesions scattered throughout the lungs. These appearances and her grave clinical condition suggested that the lesions had not responded to sulphathiazole and now appeared to be hopeless. During the following month her retrogression continued. She was taken to three other consultants independently, and all confirmed the hopelessness of general sarcomatosis. At the end of February she began to show signs of improvement, and at the beginning of May Mr. Hendry received a report that the patient had recovered and was running about again like a healthy child. A further radiographic examination made on May 10 showed that the bone lesion had resolved and the multiple lung lesions had disappeared (fig. 4). This excellent result has been maintained since.

COMMENTS

Prior to treatment the clinical signs and the radiographic appearances of this case were, on the whole, in support of bone sarcoma with multiple metastases in the lungs, but, as indicated, the bone lesion radiographically suggested an inflammatory focus.

The absolute cure is phenomenal and quite distinctive from the results of any treatment in sarcoma or osteomyelitis. The only treatment was a course of sulphathiazole, but even when this was concluded the lesions seemed to progress for about a month and the clinical condition appeared hopeless to several consulting physicians and surgeons. The possibility that the condition was xanthomatous must not be overlooked, for silent bone destruction and complete reconstruction can occur in this disease.

It may be thought regrettable that no biopsy was performed, but experience suggests that the evidence thus obtained might have been dangerously misleading. It would have made no contribution to the cure: it might have retarded it.

I wish to thank Mr. A. M. Hendry and Dr. A. V. Neale for their coöperation.

DOUBLE-EXPOSURE RADIOGRAMS OF CHEST

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Illustrations on plate

FOR the past five years I have been experimenting to obtain a composite radiogram showing the respiratory excursion. The same film is exposed twice, on maximal expiration and inspiration, and the extent of movement of the ribs and diaphragm can be clearly recorded. Vickers[1] has lately described a technique which is substantially that which I have found most suitable.

In brief, the exposure time is kept constant and the kilovoltage is varied. Vickers has found that the best results are obtained when the first exposure is made on full expiration, using the milliamp-seconds factor which would be used for a standard chest film, but increasing the standard kilovoltage slightly ($x+5$). The second exposure is then made on full inspiration, using the same milliamp-seconds factor and lowering the kilovoltage to a corresponding extent ($x-5$ or -10). In this way a sharp double outline of the diaphragm can be seen, and the movement can be measured. For an accurate study of the diaphragm (fig. 1) the X-ray tube should be centred on a level with the muscle, about the plane of the 9th dorsal vertebra; but when this is done it is impossible to include the movements of the ribs.

It is, however, an advantage to be able to record the movement of the chest as a whole, for the movements of the diaphragm and ribs should be complementary, and for this purpose it is necessary to centre the tube in the usual way so that the whole of the chest is shown on the film (fig. 2); the diaphragmatic movement appears to be a little less than it actually is; but films taken in this way are comparable with each other, and the degree of inaccuracy is relatively slight.

An alternative technique is to maintain a standard kilovoltage and to vary the exposure. The first exposure is that for a standard chest film, and the second is reduced by 50%. This method also gives very satisfactory results, but it is only practicable with sets provided with a delicate timing switch graduated at least in twentieths of a second.

PRACTICAL USES

A good double-exposure film of a normal chest provides a graphic record of the actual movements of the ribs and diaphragm during respiration, and such a film should therefore prove of great value in the teaching of anatomy and physiology. The standard verbal description of the movements of the ribs on inspiration and expiration can

1. Vickers, A. A. *Brit. J. Radiol.* 1945, **18**, 229.

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be illustrated from life and thus much more easily understood. It is also possible that the study of a film of this type may prove useful to teachers of voice production, for it would thus be possible to identify those faults in breathing which need to be corrected before a good result can be achieved.

In the investigation of respiratory disease the double-exposure film enables us to retain a permanent record of the changes hitherto noted on screening and so provides a basis for future comparison. These films are proving valuable in the observation of asthmatic patients, for they furnish useful information about the actual mechanism of respiration and so make it possible to prescribe breathing exercises fitted to the needs of the individual patient. A series of films can be taken at intervals to study the effect of treatment so prescribed. Double-exposure films are therefore likely to find a place among the routine investigations carried out in the asthma clinic.

The clinical diagnosis of emphysema is not always easy, and measurements of chest expansion, spirometry, X-ray screening, and the standard chest film must all be taken into consideration in doubtful cases. A double-exposure film, taken to show the movements of the ribs and diaphragm, is of some value in confirming the results of the other investigations. Occasionally it has revealed a greater degree of respiratory movement than would have been expected, and this result seems to indicate that the symptoms and signs in such cases are due to diminished respiratory effort rather than to loss of elasticity of the lung tissue. This observation may therefore have an important bearing on prognosis.

The power of expansion of the lower lobes is important in patients who may have to be immobilised for a long time and in those about to undergo major operations, especially on the abdomen. Lack of expansion of the lower lobes is an obvious precursor of massive collapse, and the warning provided by the double-exposure film might lead to the early adoption of preventive measures in cases of this type. These films are likely to be particularly useful in cases in which it is proposed to use a spinal anæsthetic.

CEREBRAL CYSTICERCOSIS WITHOUT EPILEPSY

COLIN EDWARDS
M.B. Sydney, M.R.C.P., D.P.M.
WING-COMMANDER R.A.F.V.R.

Illustration on plate

FEW doctors readily think of cerebral cysticercosis as a possible diagnosis when the patient has not had a fit. So the following case seems worthy of record.

An airman, aged 42, after five months' service in the Azores, was invalided home in July, 1944, because of two attacks of aphasia. The first, in May, 1944, was sudden in onset and both executive and receptive in type. After it had persisted for three hours he went to bed, and next morning felt well again except for his "usual vague headache." He remained on duty until June, 1944, when he had a second and similar attack. There was no alexia and no impairment of consciousness, and once again after an evening and night in bed his speech returned to normal. After that he had a period of freedom from all symptoms, including headache, and during this period he was repatriated.

He had been a soldier in the Middle and Far East from 1919 to 1925: Sudan 1919–20, Cairo 1920, Hong-Kong 1921–22, India (United Provinces) 1923–25. In 1924 he had had malaria, but he had never had any other serious illness or injury. Since 1925 he had lived in England, had worked as a packer in a factory, and had played football until 35 years of age. In 1937 he developed a "vague" frontal headache, which had since been wellnigh constant. In 1942 he awoke one morning to find that the left half of his field of vision was impaired, and this had persisted without alteration.

His family history included the death of a sister (cause unknown to the patient), the death of his mother from Bright's disease, and that of a maternal aunt from "epilepsy."

Physical examination in July, 1944, showed slight congestion of the retinal veins and capillaries, more pronounced on the left side. Perimetry (done by Wing-Commander F. W. G. Smith, ophthalmic specialist) revealed incongruous homonymous hemianopic defects involving chiefly the lower left quadrants but encroaching on the upper quadrants. His only speech defect was a slurring of some polysyllabic words. There was a very slight increase in the tendon reflexes on the right side, and the right lower abdominal reflex was absent, but the plantar reflexes were both flexor. The nervous system otherwise appeared to be normal. His blood-pressure was 145/95–100 mm. Hg, and no abnormalities were found in other systems. A full routine clinical examination of the urine was negative. Radiography of the skull showed nothing abnormal. The cerebrospinal fluid (C.S.F.) pressure was 90–100 mm. of water, and Queckenstedt's test was normal. The C.S.F. analysis showed no cells, a total protein of 70 mg. per 100 c.cm., a very slight increase in globulin, a negative Wassermann reaction, and a Lange curve of 4433210000. The blood Wassermann reaction was negative.

The patient's customary frontal headache grew worse for four days after the lumbar puncture and then diminished. On the fourth day after the puncture an irritating rash appeared on his thighs, legs, elbows, and forearms, and took about four days to subside.

At this stage the diagnosis seemed to offer difficulties. Wing-Commander Smith thought the field defects were due more probably to a tract lesion than to one in the optic radiation, either lesion being right-sided. The aphasia, however, indicated a left temporal lesion, as the patient was right-handed except for a few bimanual activities. Since at least two lesions appeared to be present, one colleague suggested secondary deposits—e.g., from a pulmonary neoplasm. But the history covered at least two years, and probably seven; so any malignant growth seemed most unlikely. Radiography of the chest revealed numerous calcified bodies, obviously cysterci, in the thoracic muscles, and radiography of the abdomen and limbs showed very many calcified cysticerci in the muscles and subcutaneous tissues (see figure).

A careful examination of the surface of the body and limbs now revealed two subcutaneous nodules in the epigastric region, about 1·0 and 1·5 cm. long, and a rather smaller one on the left upper arm. Except for one in the epigastric area, the patient had been unaware of their presence and had noted none before. A white-cell count showed 8300 per c.mm. (60% polymorphs, 35% lymphocytes, 3% eosinophils, 2% monocytes, and no basophils). Three consecutive specimens of stool showed no helminths, protozoa, or ova.

Wing-Commander Denis Williams (neurologist in charge of the electroencephalographic department at Military Hospital, St. Hugh's College, Oxford) reported that the patient's electroencephalogram (E.E.G.) showed short runs of waves with a frequency of 22 per sec. in both parietal regions. These interrupted a stable dominant frequency of 10 per sec. The disturbances, which were numerous, were considered to be epileptic in type. The man was invalided from the Service in August, 1944, his only symptom then being slight headache.

COMMENTS

The diagnosis here was not made before the X-ray examination, because cysticercosis was not considered. It is this failure to think of the possibility of cysticercosis which MacArthur (1933) has stigmatised as the greatest impediment to its diagnosis. Had the patient been subject to epileptic fits there is little doubt that cysticercosis would have been considered. But cases without this symptom are not rare (Marsh 1934, Dixon and Smithers 1934, Dixon and Hargreaves 1944) although distinctly unusual. This man had no fits in spite of the fact that his E.E.G. showed disturbances of an epileptic type, and that his maternal aunt had "died of epilepsy" (admittedly a statement with so many possible meanings that it might well have no significance when one is looking for an inherited convulsive tendency).

The interval between his infestation with the cysticerci and the onset of symptoms must have been at least twelve years. This is one of the longest incubation periods yet recorded, although Dixon and Hargreaves (1944) note one case where the interval was twenty years—a fact to be remembered when we see patients who have served in the Japanese war.

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Dixon and Hargreaves (1944) have reported transient rashes in cysticercosis suggesting an allergic state. Their description fits this patient's rash. He could recall no previous rash, and no medicinal, dietetic, or other cause was apparent. Whether it was precipitated by his lumbar puncture is a matter for speculation, but it is possible that the alteration in his C.S.F. pressure caused by the lumbar puncture may have led to the escape of allergens from his intracranial cysts into the blood-stream.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of obstetrics on March 15, with Prof. F. J. BROWNE, the president, in the chair, a paper on

The Problem of Postmaturity

was read by Mr. A. J. WRIGLEY, who said that he felt dissatisfied with the interpretation of the word, the diagnosis and management of the condition, and the lack of teaching on the subject. Doctors made difficulties for themselves by assuming that, if a pregnancy continued beyond the date calculated for its termination, the fœtus would become so large as to cause difficulty at the delivery; it had long been recognised that this was not so. Of the babies weighing over 9 lb. born at St. Thomas's Hospital in 1945, nearly half had been born before the calculated date; another series showed the frequency with which a small baby is born after the expected date. Some textbooks contained the statement that prolonged pregnancy did not necessarily result in a large child, while others either ignored the subject or stated that the child was always above the average size. There was equal lack of uniformity on the diagnosis and management of postmaturity. Radiography was of little help; the appearance of ossific centres varied considerably, and gave no clear indication of fœtal maturity. Some authors advised induction when the fœtus was postmature, without indicating when that state was reached, while others did not favour interference. The height of the fundus was no guide, especially in the last weeks; nor could help be derived from girth measurements, which varied enormously in different women, and did not greatly increase with postmaturity since there was no corresponding increase in the amount of liquor amnii; the engagement or non-engagement of the fœtal head after term was equally unhelpful.

Mr. Wrigley said that when the fœtus was truly postmature it was large, weighing more than 7 lb.; its size could be appreciated by repeated clinical examinations. Concurrent with increased size was increased strength and tone, so that the fœtus became more rigid—a fact that could be recognised on physical examination. As the amount of liquor apparently did not increase in the last weeks of pregnancy, the fœtus became progressively more easily palpable; a large rigid fœtus might be easily felt in a uterus containing little liquor—possibly so little that the uterine wall might be imagined to outline the fœtal position and some of the limbs. These signs could be identified only if the observer had been watching the patient throughout the pregnancy; the amount of liquor varied in different women, but towards full term there was a noticeable relative decrease. Ideas about the termination of pregnancy should be revised, and three possible variations should be recognised: (1) labour might start days or weeks after the expected date, and result in the delivery of a large postmature baby; (2) a normal-sized or even small baby might be delivered at this date; or (3) at about the calculated date the woman might be delivered of a large baby that showed every characteristic attributed to postmaturity.

The decision to terminate pregnancy should be dictated not by dates but by the fœtal development as judged by physical examination. Some doctors ordered medical induction if the anticipated date was passed, while others did not intervene. There was no justification for automatic induction one or two weeks after the expected date. By this course, some women would go into labour later than they should and true postmaturity might be overlooked, or the baby might not be mature. Moreover, routine induction often implied repeated attempts at medical induction, with its inevitable physical upheaval and anxiety at each failure. It should be a rule that if medical induction was justified, there was also justification for surgical induction. Mr. Wrigley said that patients should still be given the same estimated dates for confinement as hitherto; but it should no longer be taught that all fœtuses reach maturity in 40 weeks; it might, for example, be necessary to terminate pregnancy at the 38th week because the baby was obviously large. The routine termination of pregnancy at fixed times, such as the 40th or 42nd week, should be abolished; the combination of physical signs found by repeated regular physical examinations would indicate the course of action.

Reviews of Books

Autonomic Regulations

ERNST GELLHORN, M.D., PH.D., professor of physiology, University of Illinois. New York: Interscience Publishers. Pp. 373. $5.50.

FOR many years now there has been a tendency to speak of the sympathetic and parasympathetic as though they acted as a whole, and as though the predominance of one or the other in an individual determined his physical diathesis and even his character. There has always seemed to be some foundation for this, and indeed the fact that Harvey Cushing laid emphasis clinically on the idea is sufficient to make it worth considering. On the other hand, it has been made the basis of a slick and meaningless terminology which presupposes that such classifications of individuals are much better substantiated than they really are. In the background has always been the fact that adrenaline and acetylcholine only approximately represent the two systems in the humoral field, while the latter seems to have a wider scope of activity in the central nervous system than the former. Gellhorn's book is an attempt to evaluate and systematise the actual experimental evidence on the activities of the autonomic nervous system, in so far as these are coördinated and work towards definite ends, or react as a whole to definite situations. The results are illuminating and appear to show that the sympathetic and parasympathetic can act as units, but they are by no means always antagonistic and may discharge together under the influence of the hypothalamus. While adrenaline retains its place as the humoral complement of sympathetic activity, insulin is given pride of place in this respect so far as the parasympathetic system is concerned.

The book is arranged somewhat as follows. First of all, the autonomic reactions to emergencies, such as excess of carbon dioxide, anoxia, asphyxia, hæmorrhage, and hypoglycæmia, are described. Then the control of the endocrine organs is discussed, and finally the influence of the autonomic system on the somatic nervous system. Lastly there are five chapters summing up the physiological conceptions and the clinical applications which result from the study. Without an intimate knowledge of the subject matter in the 1100 works which are cited, it is impossible to say whether the ideas of the author will stand the test of time or not, but they are clearly based on a wide survey of available facts, owe very little to imaginative theorisation, and advance our knowledge of the way in which the organism as a whole adapts itself to its environment.

Chest Examination

(2nd ed.) R. R. TRAIL, M.C., M.D. Aberd., F.R.C.P., air commodore R.A.F.V.R., physician to the Royal Chest Hospital. London: Churchill. Pp. 122. 12*s.* 6*d.*

THIS second edition has been enlarged slightly; more illustrative radiograms have been added, and some modifications made in the text. While Air Commodore Trail's attempt at exact correlation of physical signs with radiographic appearances and with lesions is

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timely, much of it will appear controversial to the expert. There is a risk, too, that the book may burden a student's already overtaxed memory with details of physical findings whose interpretation many will consider doubtful. Admittedly, dogmatism is necessary in a short textbook, but it should perhaps be confined to broad outlines over which there is reasonably general agreement. These considerations, together with the occasional inaccuracies which persist in the new edition, detract from the value of the book for the student.

Microbiology and Epidemiology

Editors: Prof. E. B. BABSKY, Prof. I. G. KOCHERGIN, Prof. V. V. PARIN. Translated from the Russian by Dr. H. P. FOX. London: Medical Publications. Pp. 158. 15*s*.

THE 15 articles in this book are an attempt to record some of the "achievements of Soviet Medicine in the Patriotic War," and were first published in the U.S.S.R. in 1943. In appraising the value of the work one has to remember the size of the task confronting the medical services of the U.S.S.R. during the German invasion, when millions of troops constantly on the move had to be immunised against a great variety of diseases by a medical corps whose numbers could have never been sufficient. These reasons, no doubt, led to the introduction of oral vaccines and bacteriophages in the prophylaxis and treatment of intestinal diseases, and to parenteral vaccination by single-injection methods which would be hardly acceptable in Western practice. It is impossible, unfortunately, to assess the efficacy of these novel forms of treatment, for the articles are written in general terms, without references or adequate technical details, and most of the space is given to accounts of work previously done in other countries.

Two of the chief diseases with which the Soviet medical service had to deal were typhus and tularæmia. Considerable success seems to have been achieved in the early diagnosis and vaccinotherapy of these infections, and several of the insecticides used against lice were very effective. The prevalence of tularæmia in many areas was mainly caused by the mass migration of field rodents, and it was found that the incidence of cases could be greatly reduced (1) by giving up the use of straw bedding (which was often polluted by their excreta) in favour of pine needles, and (2) by building, round dugouts, warehouses, &c., snow walls 2–3 feet high, which when coated with ice could not be climbed or pierced by the animals. The chapters which deal with immunisation against cholera, dysentery, and gas-gangrene lay much stress on bacteriophage therapy, whose results are accepted with rather uncritical enthusiasm. A short article on "phytoncides," the volatile bactericidal substances produced by many plants, gives an interesting account of the therapeutic properties of onion juice. The general impression gained from perusal is that freer intercourse between Soviet bacteriologists and their colleagues of the West would be of mutual advantage.

Guide to Medical Practices

RAMSAY BROWN, chartered accountant. London: H. K. Lewis. Pp. 96. 5*s*.

HERE is a little book of information and advice on medical practice as a business, by a chartered accountant who "has had the advantage of investigating many medical practices." It is written primarily for young men wishing to set up in general practice, though it contains matter useful to those already practising and those with a practice to sell. The main chapter subjects, which will indicate its scope, are: practice, house, purchase price, finance, vendor's accounts, budget, introductory period, special sources of income, accounts, income-tax, panel, and debts and debt-collecting. Mr. Brown's experience is clearly wide, his information rings true, and his advice is prudent, taking account of human nature. He is occasionally a little cynical, and a sentence on "appendixectonomy" on p. 57 needs emendation for more than one reason; but the book as a whole well fulfils its purpose. An appendix gives in detail the terms on which certain named companies lend money on medical practices.

New Inventions

A SEDIMENTATION-TUBE HOLDER

GOOD stands to hold sedimentation tubes are very expensive when they are made to ensure that the tubes will be vertical. The relatively cheap holders described here were designed to ensure vertical tubes and to allow control of the temperature at which the sedimentation tests are performed. The holder fits over the top of the sedimentation tube, allowing it to act as its own plumb line; it is machine-turned on a lathe, from a single piece of metal, and has parallel-sided spring jaws and an absolutely central point of suspension.

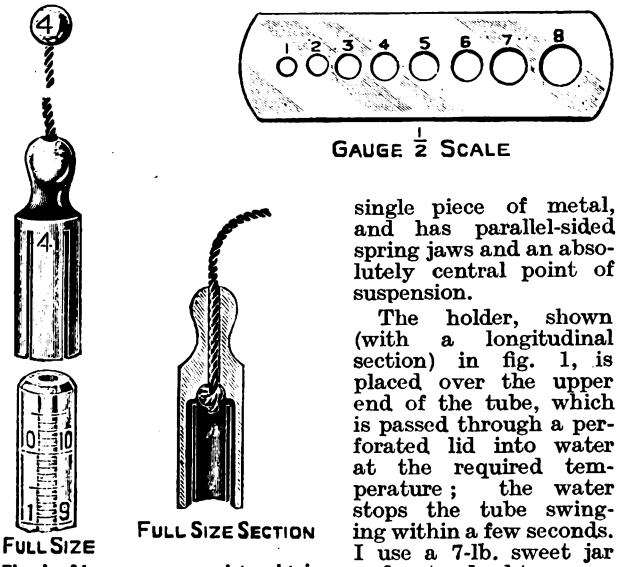

Fig. 1—Above, gauge used to obtain correct size of holder. Below, holder size 4, with section to show attachment of cord.

The holder, shown (with a longitudinal section) in fig. 1, is placed over the upper end of the tube, which is passed through a perforated lid into water at the required temperature; the water stops the tube swinging within a few seconds. I use a 7-lb. sweet jar and a standard temperature of 20° C; if the room temperature is 5% above or below this the large bulk of water may be warmed or cooled 0·5° C in an hour.

Fig. 1 also shows the gauge used; the sedimentation tube is placed into the hole that fits it most closely and this size holder is ordered. Fig. 2 illustrates the method of using the holder in a large sweet jar.

Although the holders were originally made for use on the Wintrobe type tube, they have been employed equally well on the Westergren tube, using a small "policeman" to close the lower end and a false top of cardboard to raise the perforated lid on the sweet jar. I have now used these holders for over 2000 tests performed in the Wintrobe, and over 600 in Westergren type tubes, using the Hawksley (thick glass) or the Baird & Tatlock (thin glass) type of Wintrobe tube, and all sizes of Westergren tubes.

I hope later to publish details of experiments illustrating the importance of controlling the temperature in this test; these holders allow its easy control.

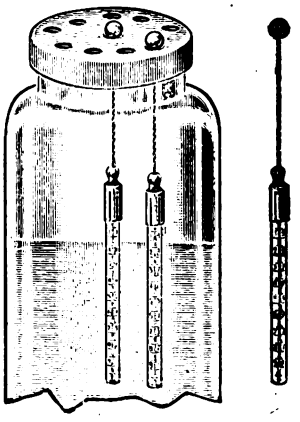

Fig. 2—Method of using confectionery jar containing water at 20° C with perforated lid for suspending tubes in holders.

I would like to thank Mr. E. W. Switzer of Shotley Bridge, who hand-turned the original holders; Messrs. Willen Bros. Ltd., of 44, New Cavendish Street, W.1, for their constant assistance and for making the holders; and Mr. W. Heslop who first suggested hanging the tubes.

K. B. ROGERS
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THE LANCET
LONDON: SATURDAY, APRIL 6, 1946

Past and Future

THE tendency of the medical profession to dwell on the past is sometimes carried too far. Nevertheless sound traditions have incalculable value. In considering how far the National Health Service threatens these traditions we should note that it may help us to return to some of them.

One of the fundamental features of the new scheme is that nobody will have to pay his doctor a fee; and at a stroke this will remove from medical practice much of the mercenary element that has been growing more conspicuous for fifty years or more. Those who have a feeling either for the ancient glories of medicine or for its future possibilities will agree that here is something worth pursuing for its own sake. We all know that happily there are still plenty of practitioners who serve equally all the people of their village or town, on the principle "to each according to his needs, from each according to his means"; but we must also be aware that there are many, especially in the cities, who have acquired a new and different scale of values. Looking at its history from the outside, an economist has described how the ancient and honourable craft of medicine became a profession, and the profession has "lived on into an epoch in which it has had to make its terms with, to employ pecuniary devices from, and to respond to the incentives of, business." The pressure from the system within which the doctor must live and work is slowly and insidiously "making something more of a business man out of him, and converting the thing once called private practice into a system of individual business competition." [1] The purpose of the code of professional ethics elaborated through the ages was to prevent the kind of competition in which one doctor seeks his own advantage at the expense of another, and the code has in fact been gravely weakened by the habits and attitudes of our own time. In a sharply competitive world the dependence of most medical men and women on payment of a fee for each service rendered has led to abuses which we need not enumerate but which ought not to be forgotten at this moment. The truth is that the doctor-patient relationship in its modern form needs improvement rather than preservation: it can never be wholly satisfactory while the doctor (as someone has put it) is not only a friend in need but also a friend in need of his patient's money; nor while there is competition rather than coöperation between him and his colleagues. Though the views of our predecessors in Elysium must always be a little uncertain, we fancy that HIPPOCRATES and GALEN might be pleased rather than distressed to hear that their successors in this country were no longer vying with one another for the means of supporting wife and family.

The Bill does not of course propose a change as drastic as that: in abolishing the fee-for-service system, which may lead even the best of us into temptation and has done so much to discourage the preventive treatment of illness, it still permits a limited amount of competition for capitation fees. Even so, however, it makes a consequential change which is at the bottom of much of the disquiet the Government proposals have aroused in the profession. Substitution of capitation for other fees is in itself a very good thing, because it will make medical practice less commercial; but, like other big advantages offered by the Bill, it carries potential disadvantages. As long as the doctor is paid directly by his patient, their relationship, though sometimes distant, is simple: it is their own affair and nobody else's. But when the doctor is paid by capitation fee or salary, the relationship is inevitably complicated by a third party—the body which pays out the money and might therefore claim a right to call the tune. It is in practice impossible to get rid of the fee-for-service system without introducing this third party, and its character and musical tastes are of great importance both to doctor and patient. Generally speaking, the doctor giving personal medical care ought not to accept employment by a third party whose interests conflict, or appear to conflict, with those of his patient. No difficulty arises over his employment by such a body as a voluntary hospital, which has no other function than to serve its patients; but objection can reasonably be taken to direct employment by the State, or by local authorities, both of which prefer the claims of the community to those of the individual. As the social conscience develops there is likely to be less and less antagonism between these claims; people may come to feel, more than they do now, that all the authorities belong to them and exist to help them. But to the public today the State does not appear as a purely benevolent institution, which would be sure to put its patients first: many of its activities, such as conscription, taxation, and imprisonment, are coercive, and may be inimical to the citizen as an individual; and events abroad have made people here dislike more than ever the thought of State interference with their private lives. From his own personal doctor the patient expects and should receive a personal service or a personal loyalty which would not be demanded if the doctor were felt to be an official; and the doctor, if he is to be as useful as he is now, must be free to give what is expected of him. The value of any National Health Service to its users will therefore be greater if it is clearly separate from the other activities of the State, being patently established, like a voluntary hospital, solely in the interest of the patients coming under its care. Only if the third party has the same aim as the doctor will it refrain from obtruding itself between him and his patient.

Under the Bill the third parties employing doctors are to be (1) the boards of governors of teaching hospitals, (2) the regional hospital boards, and (3) the local executive councils. Unfortunately we have not yet been told precisely how the first two will be constituted, but we hope they may fairly be regarded as semi-independent corporations composed of experts and representatives of the public, not of State officials. The local executive council is to be formed half of representatives of the public (two-thirds of them from the local health authority) and half of members of the medical, dental, and other professions concerned. It would be unreasonable therefore to

1. Hamilton, W. H., in Final Report of Committee on the Costs of Medical Care. Chicago, 1932.

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say that doctors are being asked to accept direct employment by the State or by the local authorities: the employing bodies, so far as the Bill goes, are not part of the machinery of central or local government. A third party or employer of some kind is an inescapable feature of any scheme which does away with direct payment of doctor by patient, but those who drafted the Bill have evidently recognised the objections that could be raised if doctors—and especially general practitioners—were asked to make their contract with a government department. True, the Bill makes the Minister of Health responsible for the National Health Service—an arrangement that is unavoidable if it is not to be run by local authorities. But it also goes far to realise the conception (widely favoured in the medical profession) of a service administered by public corporations rather than by the Government itself. If the regional hospital boards have the degree of autonomy that is promised them, and the powers of planning which they ought to possess but which for some reason escape mention, they will be capable of becoming just the kind of corporate bodies which most of us have wanted—suited by structure and function to create and maintain circumstances in which doctors and others can do their best work. Given the necessary degree of independence, they will be distinct from all other agencies established by the State, and can assure the public and the profession that their duty is exactly the same as that of the ordinary doctor—namely, to work for the benefit of the individuals in their charge. The local executive councils, though they are not at present to be part of the regional organisation, should have the same motive.

In what we have written the words "should," "might," and "we hope" continually recur: the National Health Service is seen to be "capable of" doing what is needed. The fact is that the Bill does not (perhaps cannot) provide a picture of the service which the profession is invited to join; the nature of this service will depend on how it is interpreted. To participate must therefore be a venture of faith—a faith, however, which would be in a position to move mountains. If the profession decides on this venture it should take care not to do so in the grudging and pessimistic spirit that would postpone success. What is offered is in some respects a new professional environment, a new estate for development; and if we go into it we should not go as prisoners but rather as people determined to utilise all its possible advantages for the public we serve. The terms of entry would enable us to play a large part in its future evolution: they give the profession an opportunity of influence it has never had before. Indeed, this influence is already at work; so if we intend to enter the service in two years' time we should henceforward avoid prejudicing it in the eyes of the public, or in our own. If on objective examination we conclude that the present proposals will lead to a "State medical service," with all that this implies of regulation and government interference between doctor and patient, we shall do well to reject it; but if on the other hand we believe that, by our endeavours or otherwise, it will prove to be something quite different and acceptable we should be careful, both now and later, not to describe it disparagingly as a State service or to suggest that in joining it we are bowing to *force majeure*.

There is reason to suppose that those who designed the Bill seek, like the profession, to preserve all that is best in the relation between patient and doctor: the argument against interference has seldom been put better than in the 1944 white-paper when it said:

> "There is a certain danger in making personal health the subject of a national service at all. It is the danger of over-organisation, of letting the machine designed to ensure a better service itself stifle the chances of getting one. . . . The fact that public organisation ensures the service must not destroy the sense of choice and personal association which is at the heart of 'family' doctoring. . . . The practice of medicine is an individual and personal art, impatient of regimentation. Whatever the organisation, the doctors taking part in it must remain free to direct their clinical knowledge and personal skill for the benefit of their patients in the way which they feel to be best."

No exception would be taken if the profession were to declare that it participates on the clear understanding that (in the words of the Negotiating Committee's principle II) it remains "free to exercise the art and science of medicine according to its traditions, standards, and knowledge, the individual doctor retaining full responsibility for the care of the patient, freedom of judgment, action, speech, and publication, without interference in his professional work." On that understanding we could go far to conquer not only bureaucracy but also some of our own professional weaknesses. The traditions of medicine are not concerned with particular modes of remuneration but with a particular kind of service to others.

Methyl Alcohol Poisoning

THE manifestations and the risks of methyl alcohol intoxication have been recognised for half a century or more, but its mechanism and treatment have still to be satisfactorily defined. Recent reports from Germany [1] and the United States [2 3] recall that these are ever-topical problems. Thus in north-west Germany when victory in Europe was being celebrated 11 British soldiers drank methyl alcohol at a party given by displaced persons [1]; 6 died and another was blinded, probably permanently; many more of their hosts suffered as severely. Victims may come to ingest the spirit in a number of ways. Addicts of denatured alcohol have taken repeated small quantities without apparent ill effect.[4] As a rule, methyl alcohol is consumed because it is cheaper than ordinary alcohol—the drinking of "red biddy" is an example, though fatal results are fortunately rare owing to the low content (about 4%) of methyl alcohol in commercial methylated spirits. Methyl alcohol may be sold maliciously to replace or supplement ethyl alcohol; or it may be innocently mistaken for ordinary alcohol. The metabolism of the two alcohols differs profoundly. Whereas ethyl alcohol is quickly oxidised in the body to carbon dioxide and water and is excreted within 24 hours, methyl alcohol may persist in the body for some days, during which it is excreted in the expired air,[5] via the stomach,[6] and in the urine. It is slowly oxidised to formic acid and formaldehyde,

1. Dewar, H. A., Wickham, B. F. *Jour. R. Army med. Cps*, 1945, 85, 92.
2. Chew, W. B., Berger, E. H., Brines, O. A., Capron, M. J. *J. Amer. med. Ass.* 1946, 130, 61.
3. Jacobsen, B. M., Russell, H. K., Grimm, J. J., Everett, C. F. *Nav. med. Bull., Wash.* 1945, 44, 1099.
4. Menne, F. R. *Arch. Path.* 1938, 26, 77.
5. Asser, E. *Z. exp. Path. Ther.* 1914, 15, 322.
6. Bongers, P. *Arch. exp. Path. Pharmak.* 1895, 35, 415.

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and formic acid has been found in abnormal amounts in the urine 8 days after ingestion of methyl alcohol [7]; excessive amounts of lactic and other organic acids are also produced, so that profound acidosis results, and the carbon-dioxide-combining power of the blood may fall as low as 10 volumes per 100 c.cm. Opinion is divided on the responsibility of the alcohol itself or of its breakdown products for the resulting disturbances; nor has the specific action on the retina been fully explained. Individual susceptibility to methyl alcohol varies widely [8]; death has followed ingestion of as little as an ounce,[9] while other people have drunk more than ten times that amount and survived. It is generally thought that simultaneous or subsequent consumption of ethyl alcohol decreases the toxicity of methyl alcohol by displacing it from the body-cells; varying proportions of the two are usually taken together, and this may partly account for the varying response.

Toxic symptoms may appear within an hour or may be delayed 40 hours or more. It is common for victims to feel well and to do a full day's work between consuming the poison and noticing any disturbance. Dizziness is a common early symptom; weakness, headache, drowsiness, nausea, vomiting, and sometimes epigastric pain follow rapidly, and the patient notices dimness of vision, possibly with disturbance of colour sight, which may be rapidly superseded by blindness. Within an hour or two he may have gross air-hunger dyspnœa, and be profoundly cyanosed. Restlessness and confusion, which indicate a probable fatal outcome, may be followed by coma, convulsions, and death. DUKE-ELDER [10] has summarised the published reports on the eye changes. An acute papillitis with swelling and dilatation of the veins may develop and be followed by atrophy; or a primary chalky-white pallor of the disk may be the first change. Paresis of the extra-ocular muscles has been observed; and retinal hæmorrhages may occur. It is probable that the primary retinal damage is to the ganglion cells,[11] and that the optic atrophy is secondary. But it is not clear whether the inflammatory œdema of the nerve head is a reaction to the sudden degeneration of so many nerve-fibres, or whether it too is the direct result of the poison.

Apart from attempts at elimination by gastric lavage and the administration of copious fluids, and the protection of the eyes from light, treatment is directed mainly towards the relief of acidosis. Alkali therapy has been employed for some time, but its importance has been proved only recently by American workers,[2] using massive doses of sodium lactate. Checking progress by the carbon-dioxide-combining power of the plasma, they administer intravenously 160 c.cm. of a molar solution of the lactate in a litre of an isotonic solution of three chlorides. When sodium lactate is not available, freshly prepared 5% sodium bicarbonate in 250 c.cm. doses may be used, but the lactate is preferable as yielding the sodium ion more slowly into the system. Sodium bicarbonate is given by mouth in doses of 4 g. every 15 minutes for four doses, or, if the patient is unconscious, by stomach tube. This routine may have to be repeated three or four times to raise the combining power from 10–20 to 40–50 volumes per cent. Where there are no facilities for checking the plasma bicarbonate, the urinary reaction may be used as a guide to the administration of alkali. Continued treatment with sodium bicarbonate, 2 g. an hour, is recommended while the urinary pH is below 7·0, and 2 g. every two hours when the pH has reached 7·0. Of 31 cases so treated after taking an average of 222 c.cm. of methyl alcohol only 5 died, of whom 4 were moribund when first seen. Response to treatment was prompt; within 24 hours blurring of vision had cleared in many cases; congestion and œdema of the optic disk diminished within 2–3 days; and only 2 cases had persistent eye changes with pallor of the temporal side of the disk; one had persistent concentric contraction of the visual fields, and the other large cecocentral scotomas. For the present this form of treatment should be adopted as the routine.

7. Merritt, W. A., Brown, A. E. *Proc. Mayo Clin.* 1941, **16**, 666.
8. Roe, O. *Acta med. scand.* 1943, **113**, 558.
9. Ziegler, S. L. *Brit. J. Ophthal.* 1921, **5**, 411.
10. Duke-Elder, W. S. Textbook of Ophthalmology, London, p. 3022.
11. MacDonald, A. E. International Congress of Ophthalmology, Amsterdam, 1929, vol. II, p. 440.

The World's Food

THE partial eclipse of our earth by famine seems no longer in doubt; at least a quarter of the human race must lie in the path of the shadow. At a time like this, any attempt to estimate world supplies of meat, sugar, or vegetable oils in relation to pre-war production is a meaningless statistical game; even the margin between wheat and rice is blurred, since the normally rice-consuming areas of the East are driven to solicit shipments of wheat, maize, oats, or any other cereal the surplus countries can afford them. The rice deficit, according to American figures, is one of at least 15% and it may be considerably greater. The basis of calculation is simple: its unit is the calorie value of that amount of grain, with a side estimate of the potatoes and green leafy vegetables, needed to provide a sufficiency of the essential vitamins; and of the amount of dried milk needed to support infant life.

It seems that we in this country are to pass the next year or more in a kind of dietetic limbo, hearing the tales of travellers who return from the hell to the east or from the milk-and-honey lands to the west. This is not altogether a wholesome condition, but it is one that engenders a mood of scientific detachment. There is little that we can do: we can lengthen the rate of flour extraction to 90% and include a 5% admixture of oat or barley flour; and we can doubtless reverse the cropping policy by which we have become 5–10% more dependent on imported food than we were in 1944. Occasionally we hear the question, Why should we sacrifice to feed the world? But has this question any validity? We are importing at least 4 million tons a year of the world's scanty stocks of wheat—a larger quantity, it appears, than any other single country. As for the stocks of food, calculated at 900,000 tons, that were shipped from this country into Europe during 1945, all but a few hundred tons of potatoes and vegetables was never ours; we merely provided the natural warehouse for the storage of food that had been shipped to these shores for relief of the Continent.

The question is now arising, to which countries shall the available grain be sent, and which countries shall be left to starve? There is doubt whether the

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normally surplus areas of rice production can supply more than 10% of their pre-war exports; from Siam, the best we can hope for is 500,000 tons, of which the bulk will be absorbed by the deficit rubber estates of Malaya, and by Ceylon where the crop is no more than half the normal. The announcement that Siam's rice was to be commandeered as reparations inevitably influenced a government and people that believed themselves to have been liberated rather than conquered by the Allied armies; such rice as might have been at our disposal vanished overnight, to reappear, if at all, in the black markets of Singapore and other trading centres. The condition of the Indonesian peoples is obscured by the present political position; probably native assurance that the food situation is well in hand is nearer the truth than Dutch reports that shortages of alarming dimensions may be expected within the next few months. But the area is patently disturbed, and, though the story of a million tons of exportable sugar is probably correct, there is little chance of finding either labour or transport for its removal.

The new white-paper (see p. 513) gives the world wheat deficiency for the crop-year 1945–46 as 8 million tons, and the rice deficiency for 1946 as 3 million. It would be comforting to accept these figures, but they do not wholly accord with the statistical reports from Washington. Since, with starvation, rice and wheat are interchangeable, the overall deficiency can obviously be estimated only in terms of total grain. In face of reports from the East, the Indian grain deficiency can hardly be estimated at less than 5 million tons; and the Chinese deficiency, when the full effects of war, droughts, and floods are taken into account, can be little less. Of all areas, the most seriously affected, according to Washington, is Japan, which has obtained a harvest little above 75% of her pre-war average; as we noted last week, her fisheries, which before the war provided at least 5% of her calories, are restricted to inshore waters; and her food imports, which accounted before the war for at least 15%, are presumably lost for some time to come. An American commission is investigating a request from the military authorities for abnormally high consignments of grain, and in a few weeks the internal conditions of this dead empire may be revealed to a world already insensitive through its suffering.

Should this state of affairs have been foreseen, or at least imagined? Did we prepare even for that part which is the result, not of the vagaries of nature, but of the operations of war? The problem was one of storage and of the maintenance of cereal acreage. Yet by our own bread and cropping policies in 1944–45 we lost some hundred thousand tons of wheat that could in theory have been held in reserve. We gave more to stock; but farm animals, as everyone now realises, are wasteful converters of cereals. What we did was repeated on a far greater scale in the wheat-producing countries. The burden of grain relief was bound to fall on them, and in particular on Canada and the U.S.A., which probably hold at least three-quarters of the world's exportable grain. According to the white-paper on the world grain position, the acreage under wheat in the four main producing countries appears to have been 16% less in 1945 than in 1938. The biggest reductions were in Australia, partly no doubt through drought, and in Argentina, whose economic policy had reduced her markets. This restriction of acreage can have been due only to the apprehension with which all these countries contemplated, in the early months of 1945, their vast reserves of grain. It was seen that the diversion of stocks to the manufacture of commercial alcohol was bound to decline once the natural rubber resources were regained by the Allies; and the diversion to stock-feeding would offer only temporary advantage if the ending of Lend Lease were to bring a steep decline in the demand for bacon, dried milk, and dehydrated eggs. In the absence of a unified policy for the disposal of surplus stocks of wheat and animal products, governments and farmers were still haunted by the restrictionist spirit of pre-war agriculture. We neglected to exorcise the fear of abundance, and humanity must suffer for our failure.

It is not for us to judge the transatlantic farmer. Some recent measures in the United States have limited the use of grain in the manufacture of alcohol and beer, while others are aimed at the diversion of grain from the feeding of pigs to the feeding of men. These measures may be effective; but it is difficult to judge either the adequacy of the proposed prices or the mood of the farming communities. One estimate suggests that stock-feeding with wheat, if it persists at the same rate as in 1945, will consume about 5 million tons during the first six months of the present year. We must recognise that in 1944 the quantity of wheat used for stock-feeding and for commercial alcohol was abnormally high, accounting for at least 16 million tons. These stocks have vanished beyond recall. What remains is the chance that the large producing countries will agree to lower the carry-over stocks that they count on having by mid-1946. A wheat-producing country normally holds such a stock as an insurance against the risk of a poor harvest; and the total quantity that the four producing countries have been proposing to hold is about 12 million tons. If that figure were cut by half, a further 6 million tons would be released into the world pool. This might make our 1946–47 reserves dangerously low, but can we afford not to take the risk? Famine is a cumulative disaster, since starving men must needs be ineffective cultivators. That is the dilemma with which we are faced; and in our response to it, self-interest will conflict with our more generous instincts until we learn to merge both in a common effort for survival.

PAPWORTH HONOURS FRENCH VISITORS.—About a year ago the secretary-general of Papworth Village Settlement visited France to study methods of combating tuberculosis. A return visit is now being paid by French doctors, including Dr. A. Courcoux, vice-president of the Comité National de Défense contre la Tuberculose, and secretary-general of the Société de la Tuberculose. Welcoming the guests at a luncheon in London on March 29, Mr. J. E. Bidwell, chairman of the committee of management, recalled that Papworth had been founded with the aim of offering employment in the right conditions to patients who might break down if returned to the environment in which they had contracted tuberculosis. The success of the venture was indicated by its growth: in 1918 there had been 25 patients; now there were 500; and the sales of the Papworth Industries, which in 1918 had been £401, had multiplied a thousandfold. The settlement had enabled restored working capacity to be translated into terms of wages—a consideration which was one of the tuberculous patient's main concerns. A great debt was owed to the imagination and genius of the founder, the late Sir Pendrill Varrier-Jones.

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Annotations

THE POSTGRADUATE FEDERATION

THE British Postgraduate Medical School was incorporated in 1932 as a teaching centre for Britain and the Empire. Its aim was to provide training for prospective specialists, instruction for doctors needing advanced teaching, and short refresher courses for general practitioners. In some of these directions it has done admirable work, but its resources have been limited. The original building scheme was greatly curtailed owing to the depression of the early 'thirties; no arrangement was made for training in special branches of medicine; and the facilities have not permitted the full development of postgraduate education for general practitioners. Perhaps the choice of site, distant and inaccessible as it is from the centre of London, was not of the happiest.

This condition is now to be corrected. The Good-enough Committee's recommendation that the school "should be reconstituted as a federal organisation embracing not only . . . the Hammersmith Hospital . . . but also the various institutes in the various special subjects" is to be carried into effect by the newly formed British Postgraduate Medical Federation, whose central office has already been established and is dealing with applications and inquiries from demobilised medical officers. Grants are to be made to the Institutes of Laryngology and Otology, Ophthalmology, Neurology, and Child Health, and later to an Institute of Dermatology; and the school at Hammersmith is to be one of the constituent institutes of the federation. Other specialist hospitals have indicated their willingness to take part, but owing to lack of accommodation it is unlikely that their teaching schools can be formed immediately into specialist institutes. Meanwhile these hospitals may be associated with the federation, and may be used for specialist training. Increased demands from overseas have necessitated expansion of the clinical facilities in general medicine and surgery; and the London and Middlesex county councils have agreed to take 20 additional graduate students after April. A similar expansion in obstetrics and gynæcology, in coöperation with Queen Charlotte's Hospital and the Chelsea Hospital for Women, is under consideration. Advanced courses in general medicine and surgery may soon be offered to specialists who require a short period of academic instruction to complete their training or obtain a higher degree; registrarships for trainee specialists are to be established at the specialist hospitals as well as at Hammersmith, and it is hoped that travelling fellowships may become a feature of the training. The fortnight's refresher courses for general practitioners are later to be replaced by part-time clinical assistantships, monthly meetings, annual intensive courses of one week, and weekend courses.

The federation will complete the structure of which the school at Hammersmith is the firm foundation; by encouraging visits from overseas it will help to make British medical work better known, and at home it should do much to raise the standard of medical training, particularly in the special subjects. Our news columns this week contain the announcement that the director will be Sir Francis Fraser, late director-general of the Emergency Medical Service.

ARTIFICIAL RESPIRATION

Bertrand Russell has said that sin is geographical. It appears from this book[1] that the same is true of the best method of artificial respiration. Silvester's method is highly regarded in Scandinavia, though Nielsen's method is the favourite in Denmark. In America, Drinker has evolved an effective combination of Nielsen and Schafer. All these require more than one person, and there is good reason for insisting on proficiency in Schafer's method, which can be performed by one. Nevertheless, help usually comes to the lone rescuer, and the claims of methods requiring more than one person should be investigated. By far the most original and apparently the most effective of these is Eve's rocking method, which can be applied under a variety of circumstances, and which has been adopted by the Royal Navy. It is described in detail in its many modifications in Dr. Eve's new booklet; but so are all other methods, and the claims and special applications of each are fairly stated. The principles of respiration and the part played by the circulation are clearly described, and the mechanical disadvantages of Schafer's method are indicated. The title of the book is a true statement of its contents, and should be in the hands of rescue workers and instructors.

1. Artificial Respiration Explained. F. C. Eve, F.R.C.P., senior consulting physician, Royal Infirmary, Hull. Edinburgh: E. & S. Livingstone. Pp. 76. 3s.

B.C.G. IN SCANDINAVIA

A GREAT deal of work has been done with B.C.G. vaccination in Scandinavia during the war years, and views on its efficacy continue to be much more optimistic there than is usual in Britain or the United States. In Norway, Dahl, Hertzberg, and Refsum[1] have reported on 1769 persons injected with B.C.G., of whom 17 later showed manifestations of tuberculosis, such as pleurisy or erythema nodosum, 3 of these culminating in active pulmonary tuberculosis. In several of the 17 cases the vaccination had not rendered the patients tuberculin-positive—an observation confirmed by several workers. Administration by mouth finds little favour outside France. Elsewhere B.C.G. is given by injection. Wallgren[2] says that the subcutaneous route is not employed in Sweden because it may produce violent reactions with abscess formation; intracutaneous injection is preferred because any abscess it may provoke remains small, and superficial, and clears up rapidly; it also permits of greater accuracy of dosage, and the scar it leaves may several years later show the examining doctor that a tuberculin-positive child has undergone B.C.G. vaccination—a fact which may have slipped the parents' memory. There is a movement in Sweden for B.C.G. vaccination of every tuberculin-negative member of the community; Wallgren has concentrated on those who stand most in risk of infection, though he hopes to increase the indications and persuade more to submit voluntarily to vaccination. In Uppsala, Kristenson[3] vaccinated 202 probationer nurses with B.C.G. between 1929 and 1939, with a follow-up in 1940, when all were still alive; 20 had by then developed tuberculous lesions, of which 2 were pulmonary. The probationers with signs of tuberculosis had either not reacted at all or reacted feebly to B.C.G.; none of those who gave a strong local reaction developed any tuberculous infection. The incidence of erythema nodosum (of which there were 6 cases in this study) was much lower among the B.C.G.-treated probationers than among female controls, in whom it was 15%; this manifestation of tuberculosis is much more common in Scandinavia than in the British Isles. Jensen,[4] in Denmark, has noticed that the virulence of B.C.G. varies somewhat, but even in its most virulent forms it has never given rise to progressive lesions. The variations have, however, proved very troublesome, since if the virulence is too low, the vaccine produces no positive tuberculin reaction and therefore no immunity, whereas if it is too great, abscesses form. Jensen says that he and his colleagues have now worked out a technique which has ensured an approximately constant virulence of the vaccine over several years.

1. Dahl, E., Hertzberg, G., Refsum, E. *Nord. Med.* 1941, p. 1381.
2. Wallgren, A. *Ibid*, 1942, p. 2101.
3. Kristenson, A. *Ibid*, 1944, p. 2015.
4. Jensen, K. A. *Ibid*, 1944, p. 170.

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From his experience with 7488 persons vaccinated with B.C.G. Winge [5] concludes that "the tuberculosis morbidity in a tuberculous environment has been appreciably reduced, particularly in children, for among 1823 vaccinated children in a tuberculous environment there were only 5 who developed tuberculosis, and none of them died." He adds, "We must make sure that the persons to be vaccinated are really tuberculin-negative; a Mantoux test, up to the highest dose, must be done. If we vaccinate tuberculin-positive persons, we risk very unpleasant local reactions at the site of vaccination." He recommends vaccination of all tuberculin-negative people who are members of the staffs of hospitals and sanatoria or otherwise specially exposed to infection. Rydén,[6] whose observations cover about 15,000 vaccinated persons in the Swedish town of Örebro, has found that about 99% of tuberculin-negative persons can be rendered tuberculin-positive by B.C.G.; and 91·7% of the newborn children vaccinated were rendered tuberculin-positive, a higher rate than most observers have achieved. Over 98% were still tuberculin-positive one to two years after vaccination, and over 93% after two to three years.

TOXICITY OF THIOURACIL

THE past three years has established thiouracil as a powerful antithyroid drug which usually leads to a remission in the symptoms of toxic goitre but sometimes produces toxic reactions and is not free from risk. Anyone employing the drug should know the extent of this risk and how to prevent reactions or recognise and treat them at once if they arise. Two surveys made in the United States, covering 1091 and 5745 patients treated with thiouracil (some are probably included in both groups), have provided useful information on these points. The first [7] is based on the experience of eleven clinics in the U.S.A. and one in England (University College Hospital). The second [8] analyses the replies to a questionary organised by six drug manufacturers distributing thiouracil, and is a report to the Council on Pharmacy and Chemistry of the American Medical Association. The reports are similar in scope and results, and can be considered together.

Agranulocytosis, the one really serious toxic effect of thiouracil, occurred in a little more than 2% of cases, and caused death in 0·4%; more than 70% of these cases of agranulocytosis developed within the first eight weeks of treatment. No relation could be discovered between the incidence and dosage; nevertheless, the tendency is to give smaller doses, and nothing seems to be gained by exceeding 0·4–0·6 g. daily as the initial dose. Close supervision is essential during the first two months of treatment, and the patient and her medical attendant must be instructed that the development of fresh symptoms, in particular a sore throat, is an indication to stop the drug and report for treatment immediately. These precautions are even more important than the periodic white-cell counts which may be done during the early weeks of therapy. The inquiry does not provide any information on preventive treatment, such as the administration of liver or other preparations which some believe to protect the marrow; nor does it give any data on the relative toxicity of thiouracil and methyl thiouracil. The best treatment of agranulocytosis, apart from stopping the drug immediately, is probably by large doses of penicillin (up to 500,000 units daily), though folic acid, liver extract, various members of the vitamin-B complex, and other substances have been considered useful. A milder depression of the granulocytes, without the infection which characterises agranulocytosis, was noted in about 4% of cases. The significance of this finding needs to be carefully assessed, since slight neutropenia has been generally regarded as usual in untreated toxic goitre. Neutropenia can develop into agranulocytosis if the drug is continued, but agranulocytosis more often comes on suddenly without warning; and the usual course of neutropenia is a return of the count to normal if thiouracil is omitted, or given in reduced dosage, for a few days. Other toxic effects were found in about 10%, the commonest being fever, glandular enlargement, and various types of rash. Van Winkle concludes that thiouracil is effective in the management of thyrotoxicosis, and should be used in toxic goitre preoperatively or when operation is contra-indicated. Three-quarters of the investigators agreed that the incidence of adverse reactions to thiouracil was less than the incidence of complications from other methods of treatment.

5. Winge, K. *Ibid*, 1944, p. 172.
6. Rydén, S. *Ibid*, 1946, p. 146.
7. Moore, F. D. *J. Amer. med. Ass.* 1946, **130**, 315.
8. Van Winkle, W. jun., et al. *Ibid*, p. 343.

GAMMA GLOBULIN IN INFECTIVE HEPATITIS AND MUMPS

A NEW and unexpected development in the use of gamma globulin has been in the prophylaxis of infective hepatitis. The first trial [1] was made in a summer camp for boys and girls, where 80 cases of hepatitis had already occurred, so that all the inmates had probably been exposed to infection. Of 29 boys injected, 4 developed hepatitis but none was jaundiced; among 130 controls, 60 had jaundice and a further 30 hepatitis. Figures of the same order were recorded among the girls. All of the injected children who developed hepatitis did so within ten days of the injection and no additional cases arose among them later. Cases of jaundice continued to appear among the controls for thirty-two days. A similar trial by Havens and Paul [2] during an epidemic in a residential home for children gave even more striking results, the incidence of jaundice among the controls being about ten times higher than in the injected group. Once again, those who developed jaundice after injection did so within a few days. The dose employed (0·08 c.cm. per lb. body-weight) was less than that used by Stokes and Neeve (0·15 c.cm. per lb.); and it seems probable that the better results were due to prophylaxis being started earlier in the epidemic. The high incidence of hepatitis among American troops in the Mediterranean theatre provided an opportunity for assessing the value of this method in adults.[3] Groups of Air Corps personnel living in the same area and under the same conditions were chosen for test and control. In three injected groups the incidence of jaundice ranged from 0·4 to 1·0%, and in a similar number of control groups from 2·0 to 3·7%. At the time the infection in the area was endemic rather than epidemic. Further observations by the same workers [4] suggest that no benefit is obtained if injection is delayed until the development of clinical hepatitis, even with the large dose of 0·3 c.cm. per lb. body-weight.

In view of these successes in the prophylaxis of infective hepatitis, it seemed reasonable to investigate the efficacy of gamma globulin in the prevention of "transfusion hepatitis," though it is still doubtful whether identical agents are responsible for the two conditions. The experiment was conducted at a hospital in the U.S.A. receiving battle casualties from overseas.[5] These made up rather less than half the patients, but 95% of the cases of hepatitis occurred among them. About half of those who had received transfusions overseas were given two injections of 10 c.cm. of gamma globulin at an interval of four weeks; the incidence of

1. Stokes, J. jun., Neeve, J. R. *J. Amer. med. Ass.* 1945, **127**, 144.
2. Havens, W. P. jun., Paul, J. R. *Ibid*, 1945, **129**, 270.
3. Gellis, S. S., Stokes, J. jun., Forster, H. W., Brother, G. M., Hall, W. M. *Ibid*, 1945, **128**, 1062.
4. Gellis, S. S., Stokes, J. jun., Forster, H. W., Brother, G. M., Hall, W. M. *Ibid*, 1945, **128**, 1158.
5. Grossman, E. B., Stewart, S. G., and Stokes, J. jun. *Ibid*, 1945, **129**, 991.

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hepatitis among them was 1·3%. Among those who had been transfused and received no globulin the incidence was 8·9%, and among those who had had no transfusion it was 0·3%. Two of those in whom prophylaxis appeared to have failed had already developed hepatitis before the injections. It is disappointing that an addendum to this paper reports complete failure in a similar experiment done elsewhere and differing only in the administration of one instead of two doses of globulin. Furthermore neutralisation experiments with gamma globulin against one agent of serum hepatitis using human volunteers were also unsuccessful. Possible explanations are that the dosage in the second trial was insufficient, that the potency of globulin varies, or that more than one infecting agent is concerned in producing hepatitis.

It is believed that gamma globulin will soon be generally procurable in this country. It will be useful in combating institutional outbreaks of infective hepatitis, but it brings no promise of prophylaxis or treatment in sporadic cases. If its value in the prevention of post-transfusion hepatitis is confirmed, its administration might well become a routine after the giving of blood or plasma. But points in dosage and time of injection clearly need elucidation before it comes into general use; and it would not be wise to build too great hopes on its general utility as a prophylactic on the analogy of the undoubted success that it has had in measles and epidemic hepatitis; it has, for instance, proved of no more value than convalescent serum in the pre-paralytic stage of poliomyelitis.[6]

One way of enhancing the effect of gamma globulin is suggested by a successful attempt to reduce the incidence of orchitis in mumps.[7] Of 102 American soldiers admitted to hospital with mumps, alternate cases were given 20 c.cm. of gamma globulin prepared from the serum of men who had had mumps within 1–3 months. The injections were given within 24 hours of the appearance of parotid swelling. Of the 51 injected men, 4 developed orchitis, compared with 14 in the controls. Later a similar trial was made with gamma globulin made from pooled normal serum, the dose being 50 c.cm. This time there was no significant reduction in the incidence of orchitis: of 67 injected patients, 14 developed orchitis, compared with 18 in the 67 controls. The difference may be merely a matter of antibody dosage. Fractionation concentrated the antibodies present in serum about 25-fold. The second group therefore received antibodies equivalent to 1250 c.cm. of normal serum. Estimations by complement-fixation methods show that mumps convalescent serum contains about 10 times the antibody content of pooled normal serum. The first group therefore received the equivalent of 500 c.cm. of convalescent serum, equal in antibody content to 5000 c.cm. of pooled normal serum. Though the numbers of cases in this trial were small for definite conclusions, the findings suggest that gamma globulin prepared from convalescents might succeed where that prepared from normal people gives inconstant results.

TRYPANOSOMIASIS AND TSETSE FLIES

NO-ONE who wishes to keep fully abreast of the great stream of periodical and other publications on tropical diseases, hygiene, or war medicine can afford to neglect regular perusal of the abstract journals (*Tropical Diseases Bulletin*, *Bulletin of Hygiene*, and *Bulletin of War Medicine*) produced by the Bureau of Hygiene and Tropical Diseases. Publication of these abstracts is not the only service offered by the bureau, which answers many direct inquiries, as innumerable isolated workers in the tropics and elsewhere will gratefully testify. The labour of collecting, collating, and disseminating all the information which reaches the bureau must be prodigious, and its officers deserve praise for its latest venture. This is a review of reports and papers on trypanosomiasis and tsetse flies[1] published during 1932–44, and was compiled by the bureau for the Tsetse Fly and Trypanosomiasis Committee appointed by the Secretary of State for the Colonies; but in view of its probable usefulness to a wider public it has now been made generally available.

In the foreword we are told that "this survey is not intended necessarily to present a complete account of present-day information, though in some respects, and especially in regard to the geographical distribution of trypanosomiasis, the present position is briefly stated." Nevertheless, a comprehensive summary of all aspects of recent work on trypanosomiasis is presented. The contents are set out under the following five headings: (*a*) geographical distribution of sleeping sickness in Africa; (*b*) protozoological research; (*c*) chemotherapy; (*d*) studies on the biology of tsetse flies; and (*e*) control of trypanosomiasis.

This compilation will be a valuable reference-source and record of research in a subject of enormous material and economic consequence to Africa. In a sense, it turns the wheel full-circle, since the Bureau of Hygiene and Tropical Diseases was set up in 1908 as an information service, under the name of the Sleeping Sickness Bureau, to deal exclusively with trypanosomiasis. Other branches of tropical medicine and general hygiene were incorporated in its activities only at a later date.[2] We may confidently hope, therefore, that the present survey is the forerunner of similar reviews of recent and current work in other branches of hygiene and tropical medicine. Indeed, the bureau explicitly encourages this hope by referring to the publication as Review Monograph no. 1.

N.H.S. BILL IN PARLIAMENT

WHEN, "before Easter," the National Health Service Bill comes up for second reading in the House of Commons, the Conservative Party is to move its rejection. According to the *Times* the Conservative motion, while welcoming the principle of a National Health Service, will object to the Minister of Health assuming ownership of the voluntary and municipal hospitals. It "will probably complain that the Government's scheme is being imposed upon the medical profession, and it is likely also to object to the prohibition at this stage of the sale of practices." The Liberal National Party has tabled the following motion:

> That this House, while welcoming a comprehensive scheme of health service for the nation, is unable to agree to a measure containing such far-reaching proposals involving the entire population without any consultations having taken place between the Minister and the organisations and bodies representing those who will be responsible for carrying out its provisions; and that as the measure cannot come into effect without the coöperation of the medical and allied professions, it is necessary that the terms of service offered to them by the State should be incorporated in the Bill.

THE MEDICAL REGISTER for 1946 contains 75,133 names, being 1487 more than twelve months ago; 2666 names were added in 1945, and deaths totalled 1132. The number of temporary foreign registrations has increased by 247 to 3348.

6. Bahlke, A. M., Perkins, J. E. *Ibid*, 1945, **129**, 1146.
7. Gellis, S. S., McGuinness, A. C., Peters, M. *Amer. J. med. Sci.* 1945, **210**, 661.

1. Survey of Recent Work on Trypanosomiasis and Tsetse Flies. Obtainable from the Bureau of Hygiene and Tropical Diseases, Keppel Street, W.C.1. Pp. 81. 7*s*. 6*d*.
2. Sheppard, R. L. *Lancet*, 1944, **i**, 97.

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Reconstruction

HOSPITALS

REGIONAL SURVEYS OF SCOTLAND

THE reports on Britain's hospital resources[1] are brought a further stage nearer completion by the issue of the Scottish Hospitals Survey, which is published in six volumes[2]; the introductory volume deals with matters common to all the regions, with the classification of hospitals, bed requirements, and bed standards.

Mainly for geographical reasons, a more elaborate hospital classification is necessary than in England, and the surveyors itemise (*a*) main general hospitals (voluntary and municipal), (*b*) district general hospitals (chiefly voluntary, of 100–200 beds), (*c*) country general hospitals (including E.M.S. hutted hospitals and others formerly devoted to tuberculosis and other special conditions), (*d*) other general hospitals (mainly in Edinburgh), (*e*) poor-law institutions outside large cities, (*f*) cottage hospitals, (*g*) convalescent homes, and (*h*) nursing-homes. Special hospitals include those for children, infectious diseases, maternity, eye, ear, nose, and throat, tuberculosis, and orthopædics. The inadequacy of many of the buildings, particularly of the poor-law institutions outside large cities, gives rise to remedial suggestions which mainly take the form of replacement. There is strong insistence on the necessity of organising hospitals on a regional basis, with free availability of consultants throughout the region. Integration, by the building of isolation blocks in the grounds of general hospitals, by bringing the tuberculosis service into closer relation with the general hospital service, and by dealing with specialties, such as sick children and eye and ear diseases, in departments of general hospitals is also recommended. The care of the chronic sick is rightly represented as the most formidable of all hospital problems and one whose extent will increase in the next twenty years.

The surveyors formulate bed standards which, owing to the varying demands of urban and rural areas, are necessarily elastic, but which reveal a general shortage of accommodation (alleviated since 1938 by the provision of E.M.S. hospitals, whose resources are taken into account). This shortage is accentuated by the necessity to introduce proper standards of bed-spacing into existing buildings: 8 ft. of wall-space between patients in general, children's, and tuberculosis wards, and 12 ft. in infectious wards is regarded as the minimum. The number of beds recommended is:

General hospital: 4–8 per 1000 population.
Maternity: 4–5 per 100 births.
Infectious diseases: 1·5 per 1000 population.
Pulmonary tuberculosis: 2 per death per annum.
Aged and infirm: 1·5 per 1000 population.
Convalescent: 0·5 per 1000 population.

Maternity beds are estimated on the assumption that 75% of confinements will in future be institutional and should preferably be in special sections of general hospitals, so that a full range of services is easily available. To be effective, units for infectious diseases should be of not less than 200 beds; beds for non-pulmonary tuberculosis should mainly be in country hospitals, with those for long-stay orthopædic and rheumatic heart cases, so that all may have the benefit of hospital schooling; and each general hospital should command accommodation for convalescents to the extent of 20% of its bed quota. These are high standards, and the surveyors realise that their achievement, together with that of the necessary consultant staffs, may take many years

Western Region

This is much the most populous of the Scottish regions, with 2,828,996 people in eleven counties (Argyll, Ayr, Bute, Clackmannan, Dumbarton, Dumfries, Kirkcudbright, Lanark, Renfrew, Stirling, and Wigtown), the city of Glasgow, and fifteen burghs. Organisation in eight sub-regions is recommended:

1. *Glasgow sub-region.*—This has a population of 1,335,825, the vast majority of whom are in Glasgow itself. Buildings and equipment are on the whole of a good standard, but the required number of 15,450 beds is deficient, after adjustment for overcrowding, by some 5000, without allowance for the aged and infirm, who may require up to 2000 further beds. The most interesting of the long-term suggestions are for the enlargement of the Glasgow corporation's projected new 1000-bed hospital at Newton Mearns to 1500 beds, a new infectious-diseases hospital, larger pulmonary tuberculosis units at Robroyston and Mearnskirk, and a further 600 maternity beds.

2. *Argyll and Bute sub-region.*—Argyll has 3 acres for each of its 63,000 people, and the 18,000 people in Bute are distributed over seven islands. The area is dependent on Glasgow for the major specialties. Local needs can best be met by small units with 24–30 general, 6 maternity, 12–15 infectious-disease, and 10 aged-and-infirm beds, in charge of general practitioners. Such a unit could serve a population of about 6000.

3. *Ayrshire sub-region.*—The population is 294,000 and beds in 1938 amounted to 410, with qualitative deficiencies. Wartime E.M.S. beds, suitably modified, will bring the total up to 1126.

4–8. The sub-regions of *Dumfries and Galloway* (population 141,900), *Dunbartonshire* (155,243), *Lanarkshire* (508,112), *Renfrewshire* (317,179), and *Stirlingshire and Clackmannan* (206,527) all have quantitative and qualitative deficiencies in their local hospital provision, which is reviewed in detail.

This report contains interesting reviews of special problems. It is estimated that some 3000 cases of cancer and of allied conditions will need investigation and treatment annually. The scheme should be regional, including 150 beds for radiotherapy, preferably in one, but at most in three, Glasgow hospitals; 200 surgical beds; beds in chronic wards for an unknown number of advanced cases; and peripheral clinics for diagnosis and follow-up. Deaths from cancer in West Scotland numbered 4343 in 1938. The orthopædic scheme should include outpatient clinics at central and district hospitals; orthopædic departments at the central hospitals, embracing consultative clinics, casualty department, and a few inpatient beds; a main centre in a country general hospital, with long-stay beds, physiotherapy, recreational and educational facilities, and a reconditioning centre. The services should be on a sectoral plan, three sectors radiating out into the rest of the region from Glasgow.

As regards medical staffs, the surveyors recommend that the number of part- and whole-time salaried appointments in hospitals outside Glasgow should be increased, preferably by men seconded from the Glasgow teaching hospitals, and residing in the area where they work. The first need is for general physicians and surgeons. Possibly, also, consultants from the Glasgow teaching hospitals should visit each district hospital in the region, not only as consultants, but also with responsibility for the standard of clinical work.

Eastern Region

This contains the counties of Perth, Angus, and Kinross, with a population of 399,532, including the burghs of Dundee (177,960), Perth (36,232), and Arbroath (20,000). Dundee, on which the regional service should clearly be based, has the medical school of St. Andrews University. Both the Royal Infirmary and the municipal hospital are in need of modernisation, and the best policy will be to build a new joint hospital. In bringing about the necessary expansion in the consultant staff, a conditioning (but not a limiting) factor will be the small scope for private practice.

1. See *Lancet*, 1945, i, 600; 1945, ii, 504, 681.
2. Scottish Hospitals Survey. H.M. Stationery Office, Edinburgh.
General Introduction to the Reports. By all the surveyors. 6*d*.
Report on the Western Region. By Prof. C. F. W. ILLINGWORTH, CH.M., F.R.C.S.E., F.R.F.P.S.; Prof. J. M. MACKINTOSH, M.D., F.R.C.P.E., F.R.C.P., D.P.H.; and R. J. PETERS, M.D., D.P.H. 2*s*.
Reports on the Eastern, Northern, and North-Eastern Regions. By Prof. R. S. AITKEN, M.D., M.R.C.P.E., F.R.C.P., and H. HYSLOP THOMSON, M.D., D.P.H. 1*s*., 9*d*., 1*s*. respectively.
Report on the South-Eastern Region. By J. W. STRUTHERS, F.R.C.S.E., and H. E. SEILER, M.D., D.P.H. 1*s*. 6*d*.

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Medical beds suffice only for short-term needs. Surgical beds, even from this standpoint, are too few, and alleviation should be sought by establishing a separate orthopædic department with 20–30 beds in Dundee and 200–300 long-stay beds in the Bridge of Earn country hospital, and also by fuller use of convalescent homes. Infectious diseases should be covered by two large hospitals in Dundee and Perth, with two smaller hospitals for emergency use; other existing infectious-disease hospitals should be closed or diverted to other uses. For the chronic sick, separate accommodation for the mentally normal and the mentally impaired is advised. For the nursing service the surveyors favour one combined general school for Dundee voluntary and municipal hospitals, for the Arbroath hospital, and possibly for the Montrose hospital; a training school for assistant nurses in the Dundee municipal hospital; a combined training school for fever nurses; and the employment of fully trained nurses only in cottage hospitals.

A bed bureau is on the whole considered unnecessary; direct admission to hospital at the instance of the practitioner facilitates the handing on of the material facts about the patient. The ambulance service must not be restricted by arbitrary boundaries, and close coöperation between all hospitals is essential, particularly in the use of specialist services. In view of the increasing complexity of hospital administration, it is felt that medical superintendents should become whole-time administrators, possibly responsible for two hospitals, and available in an advisory capacity to smaller hospitals, where the main administrative burden falls on the shoulders of the matron.

Among other subjects dealt with are medical committees, representation of the medical staff on boards of management, and case-sheets of a standard size but with contents adapted to suit local needs in general hospitals and completely standardised for maternity, tuberculosis, and infectious-diseases cases.

North-Eastern Region

This contains the burgh of Aberdeen (population 178,200) and the counties of Aberdeen, Kincardine, Banff, Moray, and Nairn, Orkney and Zetland. Excluding the last two, the total population of the region is 454,388. Many steps towards regionalisation have already been taken in this progressive area; Aberdeen burgh and the counties of Aberdeen and Kincardine have a medical officer of health in common, and Aberdeen hospitals, voluntary and municipal, share the same specialist staffs. The process can best be extended by the help of an expert advisory committee on appointments.

Medical beds should be increased at the Aberdeen municipal hospital and at the smaller hospitals in the region, by concentrating surgical cases in the larger hospitals. Medical units (physician, assistant physician, registrar, &c.) should be increased from two to three, and regular visits should be paid to the smaller hospitals. For rheumatic diseases it will be necessary to have an inpatient unit of 12–20 beds in Aberdeen Royal Infirmary; 100 beds for long-term treatment in a country hospital; an outpatient clinic at the Royal Infirmary; and peripheral clinics. Team-work between two full-time assistant physicians and the orthopædic staff, as well as the usual physiotherapeutic departments, will be needed.

Surgery is at present undertaken in some of the smaller hospitals by general practitioners with surgical experience. It should, in future, be confined to surgical specialists, and, since journeys of up to fifty miles are feasible with modern ambulances, should be mainly done in Aberdeen; a sub-centre at Elgin will, however, still be wanted. These proposals call for a fully trained surgeon in Elgin, and three additional assistant surgeons in Aberdeen.

Proposals are made for increasing the number of orthopædic, children's, and maternity beds; more gynæcological beds are required in Aberdeen, and infectious diseases should be concentrated in that city and in Elgin. For this, as for the other two regions surveyed by them, Professor Aitken and Dr. Hyslop Thomson recommend the appointment of the physician-in-charge of the main infectious-disease hospital as clinical director of infectious diseases for the region.

The scheme for pulmonary tuberculosis will involve doubling the present number of beds, to bring them to the required standard of 1·2 per 1000 population. The regional organisation requires: (1) a hospital of 150 beds in Aberdeen for diagnosis, assessment, and all forms of surgical treatment; (2) a sanatorium of 200–300 beds (Stracathro Hospital); (3) a village settlement; (4) accommodation for advanced cases, at first in existing small hospitals, and later alongside that provided for the chronic sick; and (5) follow-up clinics, of which the existing ten may require augmenting. Staff requirements include a clinical director, an assistant director in charge of the sanatorium, seven tuberculosis officers, a thoracic surgeon, and a consulting physician. For the chronic sick there should ultimately be a large block on the site of the proposed hospitals centre in Aberdeen. The existing pathological services are notably good, and simply require development. As regards the nursing services, amalgamation of the separate training schools at the Aberdeen voluntary and municipal hospitals would have real advantages.

Convalescent beds to the number of 358 are recommended and would include a home of 100 beds for the Aberdeen area and one of 30 beds for mothers after their confinement. Comments on hospital administration are similar to those made in connexion with other regions; emphasis is laid on the need for a single planning, coördinating, and regulating body for the whole region. The ultimate amalgamation in Aberdeen of the Royal Infirmary, the Hospital for Sick Children, and the Maternity Hospital under one governing body and one medical superintendent is commended.

The report has two brief but interesting appendices on the Orkney and Shetland Islands.

The Orkneys have a population of 21,799; hospital needs are catered for by three hospitals in Kirkwall (population 3673)—a voluntary cottage hospital of 19 beds, an infectious-disease hospital of 40 beds, and a poor-law institution. The Shetlands, 150 miles further north, have a population of 20,155 with four hospitals in Lerwick (population 5084)—a voluntary cottage hospital of 30–40 beds, an infectious-disease hospital of 34 beds, a sanatorium of 24 beds, and a poor-law institution. Each group of islands has a surgeon provided by the Highlands and Islands scheme, and both have hospital associations with Edinburgh and Aberdeen.

Northern Region

Between them, the burgh of Inverness (population 23,516) and the counties of Inverness, Ross and Cromarty, Sutherland, and Caithness cover a third of the land area of Scotland, containing a widely scattered total population of 185,223, which presents a special problem in relation to hospital and medical services. This is recognised in the Highlands and Islands scheme, under which special grants are paid to make available on reasonable terms the services of a medical practitioner. Hospitals and specialist services in the region now receive similar assistance.

Apart from the commoner specialties, in which it must be self-supporting, the primary linkage of this region is with Aberdeen and the north-east region; but Edinburgh and Glasgow hospitals are also used, and freedom of choice must be retained. (All the surveyors, indeed, insist on easy interavailability of regional services at the choice of the patient.)

Inverness has one general physician, who should be given a colleague and later a medical registrar. Between them they should regularly visit the cottage hospitals in the region, which need more medical beds. The E.M.S. hospital at Raigmore will provide the required country hospital for the various forms of rheumatism, orthopædic cases, and non-pulmonary tuberculosis.

Two general surgeons practise in Inverness, the remainder of the region being served by four general surgeons, whose salary is defrayed in part under the Highlands and Islands scheme. High tribute is paid to the quality of their work. The appointment of two surgical registrars to Inverness is recommended; they should for part of the time act as locums in the Highlands and Islands service, so that the surgeons may have a month's holiday and up to a month's study leave each year. The latter should also in future enjoy the status and emoluments granted to assistant surgeons in the central hospitals.

For cancer, dermatology, and psychiatric clinics, reliance will have to be placed on visiting specialists

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from Aberdeen. For orthopædic services, ear, nose, and throat conditions, ophthalmology, pædiatrics, infectious diseases, pulmonary tuberculosis, maternity and gynæcology, the region can be self-contained. The scattered distribution of population is illustrated by the suggestions made for maternity accommodation: apart from a new 50-bed maternity hospital in Inverness, capable of expansion to twice that size, some eleven units of 3–15 beds are recommended in the smaller centres and the islands. Air-ambulance services, of which one already exists, to connect the islands with the mainland should also be developed. Bed resources at present amount to 1224, and should be increased to 1729.

South-Eastern Region

This region includes the city of Edinburgh, the counties of Mid-, East, and West Lothian, Peebles, Roxburgh, Selkirk, Berwick, and Fife, with the large burghs of Kirkcaldy and Dunfermline. While the northern part of Fife looks to Dundee and the eastern region for its hospital services, and should in the future still be allowed to do so, the surveyors recommend that, for administrative reasons, the county should go as a unit into the south-eastern region. The total population of the region is 1,083,033, of which half is in Edinburgh and the two large burghs and two-thirds in those units and the 43 small burghs.

The bed accommodation before the war was 7078, increased by emergency hospital additions to 8671, 58% of which are in Edinburgh. There is, in the region as a whole, a shortage of 1374 general, 470 maternity, 194 infectious, 232 pulmonary tuberculosis, and 590 convalescent beds, as well as qualitative deficiencies and shortcomings arising from the large number of small units. For this area of 3000 square miles the surveyors propose four sub-regions, self-contained except for the highly specialised services, which would be centred in Edinburgh. Wherever possible, hospital centres containing all types of accommodation on a common site, and within easy reach of towns, are favoured. Apart from the obvious medical and nursing advantages, certain services, such as heating, lighting, and drainage, could be economically provided in a common centre. For this region also, the staffing of district hospitals by men of consultant status, resident in the district "for a prescribed period" and available for domiciliary consultation, but still on the staff of a senior consultant in the central hospital who would himself be available for a second opinion, is commended. The chronic sick should be treated in sub-regional general hospitals which would also care for the aged and infirm.

1. *Edinburgh sub-region.*—This has a population of 469,444. It provides already clinical instruction for an annual entry of 100 students, and the Goodenough Committee has recommended that this number should in future be increased to 180. This will necessitate access for teaching purposes to 1800 general beds out of the 3826 needed in the sub-region, of which 500 are still to be provided. Not all the existing buildings are satisfactory, and the surveyors would like to see two large modern central hospitals—the Edinburgh Royal Infirmary, with 1200 beds, and a second, of 1000 beds, to be built at Firrhill, west of the city fever hospital, where a new hospital centre could be developed. This centre would also house a maternity unit, to supplement the other accommodation in Edinburgh, and a new pulmonary tuberculosis unit. The orthopædic scheme for the region would centre on the Princess Margaret Rose Hospital, extended to 750 beds and closely linked to the central hospitals. The key unit for convalescence might well be the Astley Ainslie Institution, the size of which should be doubled. The surveyors admit that these are long-term plans, and make suitable suggestions for the interim.

2. *Fife sub-region.*—With a population of 284,000, this has the two large burghs of Dunfermline and Kirkcaldy. A further 1737 beds, of which no less than 1262 are general, are needed to make the area self-contained except for the rarer specialties. The long-term suggestions are for two hospital centres, outside Dunfermline and at Cameron, each with 750 general, 120 maternity, and 160–200 infectious-disease beds.

3. *Lothians sub-region.*—This has a population of 221,031 and has hitherto been so dependent on Edinburgh for hospital work that before the war it had only 168 general beds, of which 141 are in poor-law institutions and 6 maternity beds. Self-dependence is commended, and will be made easier by the emergency hospital at Bangour. That and Haddington will make suitable hospital centres for the sub-region, each with 500 general, 100 maternity, and 120–150 infectious-disease beds. A single 200-bed centre for pulmonary tuberculosis, to be shared by this and the Borders sub-region, like a similar 150-bed centre for the Fife sub-region, are recommended.

4. *Borders sub-region.*—This, with a population of 108,472, has only one large hospital, the emergency one of 280 beds at Peel. A new hospital centre on the lines of those previously described should be built near St. Boswells or Galashiels.

* * *

A good ambulance service, preferably based on the hospitals and controlled by the hospital service, with no artificial restrictions on the areas in which patients may be transported; good outpatient departments with an appointments system; privacy in wards, both optional and for dangerously ill patients; generous visiting arrangements; sufficient well cooked food; easy access of relatives to the doctor in charge; good social service and almoners' departments; and an efficient system of notifying practitioners of their patients' progress in hospital, or of treatment recommended in the outpatient department, are among the other matters dealt with in the introductory volume.

Special Articles

FAMINE AND MALNUTRITION IN EUROPE

SIR JACK DRUMMOND'S REVIEW

Sir BEN SMITH, the Minister of Food, presided at a meeting at the Royal Society of Arts on March 27, when Sir Jack Drummond, D.SC., F.R.S., scientific adviser to the Ministry of Food, spoke on Famine Conditions and Malnutrition in Europe. He began by emphasising the dominant position of cereals. Bread, he said, is the key to the whole problem; providing, as it does, about 1100 calories per lb., it is the chief source of energy when supplies are restricted, potatoes (330 calories per lb.) coming a close second. The proportion of total calories normally provided by bread, cereals, and potatoes varies from about 34% in countries with a high standard, such as ours, to 60–70% in peasant communities, as in south-eastern Europe. At present we derive about 45% of our calories from these sources; in some of the occupied countries the proportion has risen at times to 50–60%, and, unusually, to 66%. Such a diet can, with reservations, be quite nutritious: the bread must be made with long-extraction flour of high vitamin and mineral content; and the diet should contain vegetables, particularly greenstuff, to supply vitamins other than those of the B group in the bread and the C contained in potatoes. Expediency usually forces a diet of this composition on populations faced by food restrictions; and these components have contributed greatly to our own nutritional salvation. In western Europe the position has been similar to ours except that bread and potatoes have been rationed; this has caused an increased consumption of other vegetables by townspeople, so that the intake of vitamins A and C has actually risen. The problem after liberation was, therefore, primarily one of supplying sufficient calories; special provision for added vitamins has been needed only for young children. The disturbing reports which continued to emanate from Europe until the time of liberation probably related to the period of upheaval in the winter of 1940–41, when there was malnutrition. By 1942 there was no fear of impaired health, though the diet was sparse, especially in the larger towns.

DEGREES OF DEFICIENCY

Nutrition experts have not revised downwards the estimates of calorie needs. Although 2000 calories has been adopted as the minimum necessary to prevent disease and unrest, 2500 calories is the approximate per-capita allowance needed to maintain health and the capacity for hard work; we are eating at about this level. At the retail stage, our daily food can supply about 2900 calories; the difference is accounted for by wastage, mostly unavoidable, in shops and houses. The estimate is based on the weighted calorie needs of the various groups of the population.

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Experience in Europe has shown that where the daily calorie intake by adults falls to 1700–2000, a good deal of weight is lost, mostly in the early stages, and particularly if the subject has previously been stout; but health is not impaired, probably because the diet, though meagre, is not nutritionally deficient to any extent. At this level of calorie shortage growth of children is retarded, especially at the age of very rapid development; but health is not permanently impaired, and growth is resumed when sufficient calories are restored to the diet.

The next stage in reduction is about 1500 calories; this is the marginal figure. Failure to recognise unrationed food as a potent source of nutrition has, however, given rise to misapprehension and controversy; in this country, for example, we obtain only about 1000 calories a day from rationed foods, the other 1500 being derived from unrationed supplies, such as bread, flour, and potatoes. It is extremely hard to collect reliable information about the amount of these unrationed foodstuffs; but observation in western Holland last May proved that the total calorie intake had sunk to about 600 a day. Observations by Dr. Ancel Keys on volunteer students at the University of Minnesota showed that young men taking fairly vigorous exercise while living on an 1800-calorie diet that sufficed in minerals and vitamins had no loss of mechanical efficiency in their work, but had difficulty in sustained effort. At an intake of about 1500 calories, without much physical work, psychological changes manifest themselves in the form of irritability, apathy, impaired mental concentration and coördination, and increased reaction time. Carbohydrate metabolism requires vitamin B_1, and possibly also riboflavine and nicotinic acid, and, as the calorie intake falls, there is a related fall in requirements for these vitamins; in western Europe disturbances due to vitamin-B_1 deficiency have been practically unknown, but in the Far East, where polished rice was issued to prisoners as the staple cereal, there was widespread evidence of vitamin-B_1 deficiency.

Below 1500 calories the danger-zone is entered; a protein-deficiency anæmia, unrelated to iron intake, appears, and this was repeatedly observed in women and older children in the large cities of western Europe at the time of liberation. Famine œdema normally comes on at a later stage, but physical work accelerates its onset; Dr. Keys's volunteers showed it after 5–6 months on an 1800-calorie diet. It should be understood that no special virtue attaches to animal proteins as such, though animal proteins have, weight for weight, higher biological values than the proteins of vegetable foods; but vegetable proteins have complementary values, and a mixture of 85% wheat protein and 15% soya-bean protein has a value equal to that of milk proteins. There is good evidence for supposing that the proteins contained in wholemeal bread, potatoes, and vegetables have an excellent nutritive worth, provided enough is eaten; reduction in animal foods, with the exception of milk for young children, may do no harm.

A diet containing 1000 calories spells danger; hunger œdema and signs of vitamin deficiencies commonly appear; of the latter, in Holland, riboflavine or nicotinic acid deficiency have usually been the first to manifest themselves. Nutritional diarrhœa, simulating bacillary dysentery, also occurs, and makes the picture worse by depriving the body of the contribution to its vitamin needs normally made by the intestinal flora. Below 1000 calories, death is only a matter of time. In the concentration camps and in western Holland living skeletons were found in whom the weight of the bones (normally 15% of an adult's body-weight) accounted for 50% of the 4–5 stone that those people weighed. Death from starvation comes suddenly, after reduction of the blood-sugar to vanishing-point; but many who are near death can be revived by prompt treatment.

TREATMENT AND PREVENTION

In planning the relief of the western Netherlands, no precise advice on the treatment of grave starvation was obtainable—a disturbing thought when the millions who have died of starvation in our lifetimes are remembered. The plan was based on two assumptions: one, that people near death by starvation cannot swallow; the other, that if they could swallow they would not be able to digest the food. Both premises were proved wrong. Predigested proteins and glucose enriched by vitamins did, it is true, prove valuable as intravenous infusions to patients who were at death's door; but great success attended the feeding of these people with large quantities of a thick brew of skimmed milk and glucose with vitamins. They soon took by mouth as much as 3000 calories a day, with a protein intake as high as 300 g. Recovery was rapid, and they soon managed to eat ordinary food, gaining 1–1½ lb. in weight a day. Epidemics were avoided, thanks to the public-health measures of the Allied armies; but the incidence of tuberculosis increased. The recent influenza epidemic attacked people in German cities with no unusual severity; this may be related to new American work which indicates that virus infections might be better resisted by the slightly undernourished.

In Sir Jack Drummond's opinion, the outlook during the next four months for western Europe—as indeed for the whole world—is very grave. The success of the effort to keep the calorie level in Europe at 2000–2400 depends entirely on the provision of grain. It is simply a problem of calories, and for the nutritional expert it will remain so unless the danger-zone below 1000 is entered. The three protective foods—long-extraction bread, potatoes, and vegetables—may again prove to be the salvation of the peoples of Europe, even if they are not saved from hunger.

WORLD FOOD SHORTAGE

MINISTRY OF FOOD REVIEW

THIS week representatives of 17 European countries, and of various international organisations dealing with food-supplies, are meeting in London to coördinate their measures for coping with the widespread lack of cereals. The main absentees will be the representatives of Russia and Jugoslavia, who declined the invitation. On May 20 the food ministers of the United Nations will confer with representatives of UNRRA and the Combined Food Board in Washington, at the invitation of Sir John Orr. The situation which these conferences have to face is described in a Ministry of Food white-paper [1] just published, which shows how the food crisis developed and what steps the Government is taking to face it.

By 1945 it had become clear that the exceptional succession of droughts in many of the food-producing areas, following the dislocation of the world's agricultural economy and trade during the war, had made it impossible to compensate for shortages in fats, meat, dairy products, and sugar by increasing the consumption of cereals, and that an absolute shortage in food-supplies was unavoidable. The 1945 production of wheat and rye in Continental Europe (excluding U.S.S.R.) was 31 million tons, compared with a pre-war average of 59 million; as a result the Continent require an import of 15·6 million tons of bread grains for the current year, instead of the pre-war 3·7 million tons. India, China, French North Africa, South Africa, and other deficit countries are asking for similarly increased imports. In the East the situation has been aggravated by a serious fall in the production of rice—Burma and Siam, the principal rice-exporting countries, are expected to produce only 4·9 million tons in 1946, compared with 8·4 million tons before the war. Production of vegetable oils and sugar in the Far East has likewise fallen, so that some countries which used to export substantial quantities must now import for their own needs. The conversion of transport to war purposes has interfered with the distribution of fuel, fertilisers, and feeding-stuffs, and with the collection of farm-produce; and unsettled economic conditions have made producers loth to sell for cash. The large accumulation of stocks of wheat in exporting countries, which in mid-1943 reached 45 million tons, against a pre-war average of 12 million, obscured the gravity of the position for a time, but these stocks are now being rapidly depleted. The crucial factor in the crisis has been the general failure of the winter rains in India, which is expected to reduce grain crops by 7 million tons.

An impressive increase in food-production has been attained in North America (where the U.S.A. has raised production to 25% above the 1935–39 average), in the Middle East, and in the British Isles, but some of the increases have been absorbed by the needs of the Forces and by the greater consumption made possible by higher

1. The World Food Shortage. Cmd. 6785. H.M. Stationery Office. Pp. 23. 4d.

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wages and full employment in the lower income-groups of producing countries.

In 1945 many European countries made plans to build up their greatly depleted livestock populations, and coarse grains, such as barley, were turned over from human consumption to animal feeding. The extraction-rates of flour for bread-making were also lowered, partly to produce more offals for animals, and though these rates are now being raised again too much grain is still being fed to livestock, considering human needs. For the most economical way to use grain is to feed human beings direct—it needs 3½ lb. of grain and concentrated feeding-stuffs to produce 1 lb. of beef; 5½ lb. to produce 1 lb. of eggs; and 6–7½ lb. to produce 1 lb. of pig meat.

Consumption Levels.—The present food consumption of the civilian population in countries for which fairly reliable statistics are available is estimated as follows:

Country	Av. daily consumption (calories per head)	% of pre-war
United States	3150	102
Canada	3000	100
Australia	2900	97
Denmark, Sweden	2850–2900	90–95
United Kingdom	2850	95
France, Belgium, Holland, Norway, Greece, Jugoslavia	2300–2500	75–80
Czechoslovakia, Italy	1800–2200	70–75
Germany, Austria	1600–1800	50–60

These figures take no account of the fall in quality of the diet—e.g., in the United Kingdom 45% of the calorie intake now comes from grain and potatoes, against 34% before the war. Many people, especially in towns, receive much less than the average: thus the average consumption of the non-farming population is estimated as 1800–2300 in France and Belgium; 1400–1800 in the UNRRA countries; and 1200–1400 in the ex-enemy countries. Even these figures conceal the effect of differential rationing and varying availability of supplies. Many people who have no priority for rations and little access to unrationed or black-market foods are undoubtedly approaching starvation levels, and further reductions in rations will be inevitable as the full impact of the grain shortage is felt.

Outlook for 1946–47.—The present difficulties are unlikely to disappear with the next harvest. Some increase in production may be expected in the former war zones, and this season's droughts are unlikely to recur, but exportable supplies will fall heavily with the virtual exhaustion of stocks accumulated during the war. Good crops and a large exportable surplus in the U.S.S.R. might bring considerable relief, but no precise estimate of their supply position in 1946–47 is yet possible.

STOCKS AND REQUIREMENTS

Bread Grains.—Allowing for the maximum practicable reduction in stocks and some reduction in animal feeding, exportable supplies from the grain-exporting countries in 1945–46 are estimated at 23·7 million tons—about twice the average pre-war figure—and total world import requirements at about 32 million tons. The world deficit of wheat for the year is thus about 8 million tons.

Rice.—Supplies are entirely inadequate to meet the needs of Eastern countries where rice is the staple food. Production in Burma, Siam, and French Indo-China, the main exporting countries, fell drastically under Japanese occupation: before the war they exported 6 million tons annually, whereas the present crops are barely sufficient for domestic needs. Similarly in China production has fallen by 17% and in Japan by 20% of the pre-war average. In India bad weather has offset the effect of increased acreage; the crop this year is unlikely to exceed 25 million tons—a million tons less than the pre-war average. Total export supplies for 1946 are estimated at 2·4 million tons, against import requirements of 5·5 million tons. It will take more than one season—perhaps 4 years in Burma—to restore world production.

Meat.—Future supplies of meat will depend mainly on this year's grain harvest. If this fails the amount of grain fed to livestock will have to be reduced in all countries. This may postpone the recovery of livestock in Europe and reduce production in North America. There is little hope of substantially increased production in South America, Australia, or New Zealand to offset this decline, so that world supplies are likely to continue short of requirements for some time.

Oils and Fats.—World exports in 1946 will be about half the pre-war level, and total supplies in importing countries about 80% of normal. No substantial improvement can be expected until Far Eastern exports of oilseeds and vegetable oils approach the pre-war scale.

Sugar.—1946 may prove to be the low point for sugar supplies. An increase in European production may be expected at the end of 1946, and small exports may be obtainable from the Far East in 1947.

STEPS TO MEET THE CRISIS

With the end of the war the United Kingdom ceased to be a bastion into which Allied nations were eager to pour supplies and now had to share its claims with vast liberated areas, some of them within the Empire. With the suspension of Lend Lease and Mutual Aid, too, currency problems again became an urgent factor in determining our food imports. Since the United Kingdom is a large importer of food, the Government's efforts to ameliorate world shortages must be limited to securing the best use of land in this country, of the products of that land, and of all imported food and animal feeding-stuffs.

The maintenance of wartime controls, though irksome, has minimised our dependence on imported supplies, and the Government has played an active part in directing available supplies to areas where they are most needed.

Public Health

Smallpox

THERE have been one certain and one possible case of smallpox at Southend-on-Sea. A girl of 20 years, taken ill on March 16, died on the 28th and was found after death to have had a typical confluent smallpox. She had not been seen by a doctor owing to religious scruples, and had not been vaccinated. The girl visited Stanford-le-Hope early in March, and there had been smallpox in that area, but no contact with an infected person could be established. She worked in a laundry, but there was no evidence that she had handled infected linen. Her mother, who nursed her during her illness, has what seems to be a mild attack; she was vaccinated in infancy.

A woman from New Ferry, Cheshire, was admitted to Clatterbridge General Hospital on March 25, having developed a rash on the 22nd. Smallpox, modified by vaccination, was diagnosed on the 30th. It seems possible that she was infected by a soldier son-in-law home on leave, who had an undiagnosed rash.

Milk and Meals for Schoolchildren

Miss Ellen Wilkinson, Minister of Education, announced in the House of Commons on March 28 that the Government have decided to make school milk free of charge in all grant-aided primary and secondary schools from the date of the introduction of cash family allowances in August next. Dinners in these schools are also to be made free of charge as soon as canteen facilities suffice for the expected demand.

Infectious Disease in England and Wales

WEEK ENDED MARCH 23

Notifications.—Infectious disease: smallpox, 0; scarlet fever, 1325; whooping-cough, 2190; diphtheria, 417; paratyphoid, 4; typhoid, 6; measles (excluding rubella), 1875; pneumonia (primary or influenzal), 976; cerebro-spinal fever, 67; poliomyelitis, 8; polio-encephalitis, 1; encephalitis lethargica, 0; dysentery, 332; puerperal pyrexia, 142; ophthalmia neonatorum, 67. No case of cholera or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on March 20 was 1153. During the previous week the following cases were admitted: scarlet fever, 70; diphtheria, 25; measles, 75; whooping-cough, 29.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 3 (0) from measles, 6 (0) from whooping-cough, 6 (1) from diphtheria, 55 (7) from diarrhœa and enteritis under two years, and 77 (10) from influenza.

The number of stillbirths notified during the week was 245 (corresponding to a rate of 29 per thousand total births), including 32 in London.

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Health Centres of Today

IV. DARWEN

R. C. WEBSTER
B.Sc., M.D. N.U.I., D.P.H.
MEDICAL OFFICER OF HEALTH, DARWEN

THE civic health centre at Darwen is the administrative and clinical headquarters for the public-health services of a municipal borough with some 30,000 inhabitants. Darwen is an industrial town whose people have in the past been largely engaged in cotton-weaving. In recent years other industries, such as the making of plastics, have been established. Many of the younger women are employed, and it is quite usual for them to continue work after marriage and the birth of children; hence, many children are cared for by their grandmothers. They are a thrifty, hard-working community with characteristic Northern shrewdness; they examine innovations very carefully, but once they are convinced that a proposal is for the public good they give it full support.

Construction of the health centre was begun only a few weeks before the outbreak of war in 1939. Shortage of materials and the need for special permits soon interrupted the work, but the corporation, despite difficulties, secured the necessary materials and labour. The building came into use in August, 1942, and was formally opened by Mr. Ernest Brown, then the Minister of Health, a couple of months later.

DESIGN OF THE BUILDING

The centre is a two-story brick building; on the ground floor is a large central hall which serves as a waiting-room and is useful for public meetings. The child-welfare centre and antenatal, speech-therapy, and child-guidance clinics are also on the ground floor. A large room is used as a pram shelter—a necessary provision in a district where rain is abundant. The upper floor accommodates the medical officer of health, the sanitary inspectors, clerks, the school clinic, and the dental clinic.

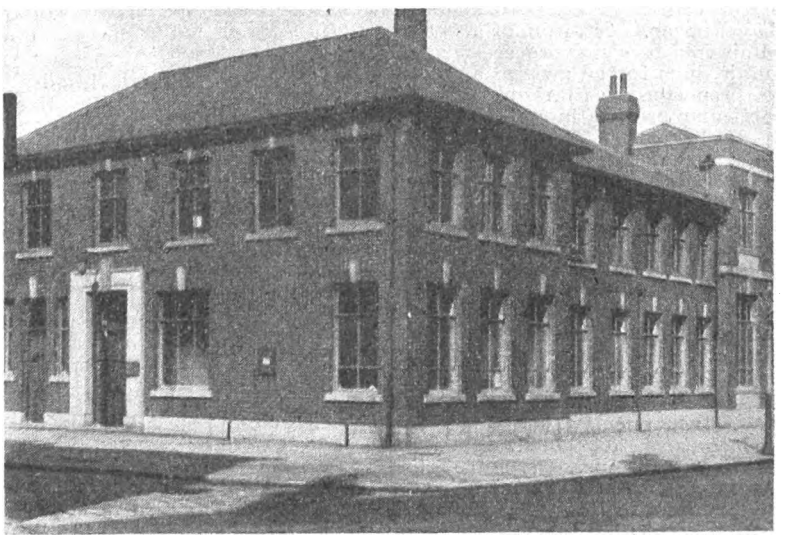
Before the centre was opened, the work of public-health administration and environmental hygiene was done in one building; that of maternity and child welfare in another; and school medical services and the dental clinic in a third. The new arrangement reflects the recognition that all these services are parts of one whole—the public care for the health of the community—and that division into watertight compartments is not only illogical but also unfavourable to efficiency. The convenience of having all records in a single building is very great: for example, when a child is seen at the child-welfare centre his condition can be readily related to his environment (housing and sanitary records), and to the condition of other members of the family (school medical and antenatal records); the necessary coöperation between the health visitors, who are also school nurses, and the sanitary inspectors is also facilitated. This centralisation eliminates the wastage of working hours by trained staff going daily from one building to another.

It was considered important that the Darwen health centre should be attractively decorated, and set a high standard of brightness and cleanliness; talks on hygiene lose most of their value if they are given in grimy and untidy surroundings, which invite unfavourable comparison between the precepts of the M.O.H. and the practice of his own department. The centre is used largely by children, who are as a rule acutely conscious of colour and react sharply to depressing surroundings. Outworn custom had dictated that the public-health offices should be painted in sombre shades of buff and dark brown, whose sole merit was that they did not readily show dirt, and hence did not need frequent repainting. There was no hesitation in adopting bright colours for the centre, most of the doors are eau-de-nil, and those of the central hall are scarlet. The corridor on the ground floor and the wall of the stairway leading to the school clinic are decorated for half their height with tiles of mottled biscuit colour with inlaid bands of green; these are pleasing to the eye, and prevent the finger-marks and the *graffiti* which otherwise would long ago have appeared. All the rooms are lighted by large casement windows in metal frames, and at night by electric lamps in anti-glare shades. The angles of walls and floors are rounded for easy cleaning. It was originally intended that the floors should be of wood blocks, but owing to war-time restrictions it was necessary to substitute slabs of a compressed composition, which has proved satisfactory; it is important in a building so largely used by children and pregnant women to avoid slippery surfaces. Heating is by a hot-water system, with a coke-fed boiler in the small basement.

USES OF THE CENTRE

Relations between local private practitioners and the public-health department in Darwen are fortunately cordial, with no sense of rivalry. The health centre is frequently used by the medical society, and practitioners often call to discuss with the M.O.H. matters of common interest. Centres serving small units of population, by encouraging this association, promote understanding between clinicians and medical administrators.

The services provided in this centre are: public health administration; environmental hygiene; antenatal and postnatal advice; child welfare; diphtheria immunisation; speech therapy; child guidance; minor ailment (school) clinic; treatment by ultraviolet rays; orthopædic clinic (conducted by a consultant on behalf of the county council); and a dental clinic. The dental clinic is fitted with a modern type of dental unit, special lighting, and a Walton gas-oxygen apparatus; it is used by schoolchildren, infants attending the child-welfare clinic, and expectant mothers attending the antenatal clinic. Its facilities are also available for one year after delivery, to include women with extensive



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dental disorders who first attend in advanced pregnancy when complete treatment may be inadvisable.

The centre is used to full capacity by the public; it is unusual for a pregnant woman not to attend the antenatal clinic, and almost all the children of the town are frequent visitors to one or more of the clinics. A justifiable civic pride in the new and attractive building, completed as it was in spite of difficulties, at one of the darkest hours in our history, has no doubt helped to favour its use; and the centre, which some doubters considered too ambitious, is already becoming too small for the amount of work with which it deals. There is space, however, for expansion.

Towards Social Security

Forms of Law

THE great spate of Bills, Regulations, and Orders which have gushed forth to celebrate the end of the war makes it necessary that everyone who wishes to be well informed should have some acquaintance with the forms in which law is expressed. In our British system we have first the Common Law, evolved over the centuries from the decision of High Court judges on particular cases but also modified by the principles of equity which originated from a competing jurisdiction. And then we have Statute Law. To the foreigner the remarkable thing about British Statute Law is that Parliament possesses, and indeed exercises, unfettered freedom to pass Acts as it pleases. Most countries have something in the nature of a written Constitution which limits the power of legislation, but the British Constitution is unwritten.

When perusing a Bill which has been laid before Parliament it is idle for the indignant reader to exclaim "But they could never do that!" A statute can set aside principles of the Common Law and equity and can override trust deeds and any other forms of law whatever.

To the reader unfamiliar with statutes the language employed is a hindrance to understanding; a specialised jargon has grown up over the years and is always employed. Many of the customary phrases, however, have great value, even to the layman. For example, when a section begins "Subject to the provisions of this Act," one knows at once that elsewhere in the document is to be found some important qualifications of the thing about to be said. Many phrases are decorated with what looks like unnecessary wording, and it is a good plan to go through the words with a pencil and strike out those that appear to be unnecessary in order to grasp the purport of those which remain. The extra words are intended, of course, to achieve a greater degree of precision if doubt should arise later. It is a cardinal principle of interpretation that, with few exceptions, the courts will interpret disputed matters according to the ordinary and natural meaning of the words as they appear. Citation of passages in *Hansard* is not admissible in court proceedings. While this may seem unfair, it is to the general advantage, because it would be preposterous to require persons in doubt over a particular passage in a statute to study the proceedings in Parliament—either of second reading, committee stage, report stage, or third reading, possibly duplicated in the House of Lords—to see whether by chance an authoritative interpretation had been laid down.

In considering possible amendments to a Bill great care is required to make sure that the terms proposed will achieve what is desired. Sometimes the study of other Acts becomes necessary; for if a thing has been said before, it is important to repeat it in the same words and avoid the inference that by using different words some different thing is meant.

There has undoubtedly been a great improvement in modern times in the general technique of drafting Bills. In particular there has been a greater willingness to include words which, though not strictly required for statutory purposes, are valuable as explanation. (An interesting illustration of this development appears, for example, in lines 25–37 of page 36 of the National Health Service Bill.) A modern innovation is to state in section 1 the main objective. Thus the National Health Service Bill says

> "it shall be the duty of the Minister of Health to promote the establishment in England and Wales of a comprehensive health service designed to secure improvement in the physical and mental health of the people of England and Wales and the prevention, diagnosis and treatment of illness, and for that purpose to provide or secure the effective provision of services in accordance with the following provisions of this Act."

The cynic may argue that such a collection of words enacts nothing and carries you nowhere. The enthusiast may reply that for the first time a veritable charter is given to sufferers of every age and class, that instead of the patient or the head of the family being left to fend for himself when the case falls into a gap between our patchwork schemes, the full round responsibility is accepted by the community as a whole as expressed through the powers and resources with which it endows its chosen Minister.

JUSTINIAN.

In England Now

A Running Commentary by Peripatetic Correspondents

FLYING back above the sunlit Sahara of cloud to London from Copenhagen, which I have just left in a snowstorm, I am trying to sort out my impressions. Practically undamaged, the most obvious shortages in Denmark are hot water and schnapps, the latter being plentiful in restaurants but impossible to buy. The real shortage, of course, is of coal, and this is preventing the wheels of industry from turning. Denmark would like to give to UNRRA, for example, the butter, eggs, meat, and fish of which she has a surplus, but she is forced to sell them for foreign currency with which to buy coal, oil, and petrol. She also claims that the hundreds of thousands of Germans still in Denmark cost her 3% of her national income, as compared with the 2% which other nations have given to UNRRA.

Copenhagen reminds one much more of Bristol, if Bristol was the capital of, say, a south-German duchy, than of cities like London or even Stockholm. Ströget, the main shopping street, has a provincial air, and people greet each other in restaurants in a way one does not see in a very large city. But the main impression brought away is efficiency. Not so much mechanised efficiency in the American way—for instance, their refuse carts are 30 years behind the times—but social efficiency. In their national insurance schemes, their education, their medical administration, and their care for the old the Danes have left us far behind. One gets the impression of conservatives reluctantly adopting advanced socialist ideas for the sake of efficiency and the general good. As everywhere else, nurses are in short supply, but the hospitals not only allow nurses to live out but some provide them with flats outside the hospital and free from the traditional restraints of the usual nurses' home—apparently with success.

A final impression is the incredibly good knowledge of English possessed by nearly everyone. Lecturing at the Rigs Hospital, I found the audience of teachers and medical students alert to one's feeblest witticisms—in fact, I did not meet a doctor who could not get along in English. With chambermaids and taximen, both sides slipped shamefacedly into German, each of us talking it rather more haltingly than they might!

One of the many Resistance stories I particularly liked: Rommel came to Copenhagen to consult a Danish surgeon after his head injury. A crowd gathered round his hotel, but when the Germans asked if they were waiting to see him the answer was, "Oh no; we are waiting to see Montgomery: he always comes close behind Rommel."

* * *

It is time that somebody made a proper study of the clinical vagaries of the common cold—"cold," "febrile cold," and "flu" do less than justice to this protean infection. I have formed part of a compact epidemiological group of five souls (two big and three small) which has been swept through this winter by three waves of "colds," each of which produced almost identical clinical

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characteristics in all its victims, but which differed sharply from wave to wave.

The first was in December, and began with a dry pricking feeling at the back of the throat. This was followed in twelve hours by an acute coryza with fever, to be succeeded one day later by laryngitis and mild tracheitis. Coughing was painful and produced mucopus and a powerful desire to vomit (the younger ones did). At this stage the fever went, but the cough was almost a whooping-cough, and might have passed as such if it had not gradually lessened during the next ten days. The other striking characteristic was an absolute loss of smell for more than a week. Six weeks later came the second variant. It began with a ticklish cough, continued as a paroxysmal sort of cough for a week to a fortnight, and died away. There was no malaise, no coryza, but simply the production of pellets of mucopus which might have come from the back of the throat but didn't. Hardly were we free from the second type than the third was upon us. Just a straightforward "code-id-de-doze" kind of nasal catarrh, the kind which causes much sneezing but encourages the idea that it will soon be gone this time—until it drags on, and odd sinuses and middle ears light up, and only a continued spell of reasonably warm weather holds out any prospect of finally getting rid of it.

Were these three separate entities, or one virus working out its life-cycle in a highly inbred community? Nobody seems to study these things, and my one attempt to arouse professional interest by sending suitable washings for further investigation to a virus-inclined colleague was stillborn—he was away sick with a feverish cold.

* * *

"Through all the changing scenes of life. . ." In the words of Doug, the messboy who acts as hospital attendant on board this 20,000-ton floating whale factory, "I've had it." For it is a far cry from Hidetail Rescue School, and from lectures to pupil midwives, to South Georgia, where we now lie, preparatory to going to the whaling grounds—in fact, some 9000 miles. And the fortnight's "holiday" picking hops in Kent between such diametrically opposed jobs has equally faded into a dream. I've not worn a collar for a month and my professional rig is shirt and shorts—partly vanity, I fear, for I'd like to be thought tough.

With a crew of 400 real tough guys, some British from Scotland and the Shetlands and the rest Norwegian, I did not expect much in the way of illness; but accidents, in the maze of machinery that there is between decks, seemed only too likely. Fortunately there have been none, and the only case that has caused anxiety was a pneumonia. (Thank you, Authority, for the penicillin.) The men come to the surgery for the merest scratch, which is all to the good. They have had, perhaps, experience of "spek finger," which to me is still nothing but a name. One has to be watchful. My original hospital attendant started off rather poorly by taking a temperature with the bulb of the thermometer sticking outboard from the lips. And only today I prepared a dose of sulphanilamide tablets crushed with alkali and left it in an officer's cabin together with lint, &c., for a poultice for his olecranon bursitis. The officer came in while I was away heating the doings, poured the dose on to the lint, and bound it neatly on his elbow.

The flora of this fascinating place seems at present mostly moss and tussock grass, but I fancy when the snows are melted there will be flowers. As to fauna, the penguins, the sea-elephants, the reindeer, and the sea-birds of all sorts make one just stand and gape. And all around are the towering snow-splashed mountains, enclosing the little bay, with its mouth guarded by a sentinel iceberg. The other hymnist's opinion of Greenland is outclassed here by the vileness of the shore station, with its shanties, derelict machinery, and, above all, the actual whaling "plant." Great reeking masses of flesh, blood, blubber, and offal offend the eye, and the stench penetrates far and wide. But it is only necessary to lift one's eyes to pity one's professional brethren working in built-up areas.

* * *

The Hunterian Society of London has a tradition of its own; and it has emerged from the war with every sign of increased strength and vigour. On Monday last, at its first ordinary meeting since 1939 (the reading of those seven-year-old minutes was as eloquent as a voice from the past), Prof. Julian Huxley joined the society for the evening, and spoke on The Second Biological Revolution. The meeting was called after dinner at a small City restaurant; plainly, the committee had not reckoned on such an enthusiastic response from its fellows; for, even with the eviction of tables and a full quota of standers, there remained a surplus outside the door, on whose behalf a fellow who was just within the body of the hall spoke with pathetic eloquence. But all was smoke and good fellowship, and though Dr. Huxley's address came as something of a cold douche, the detachment of the speaker's reasoning was corrected in the end when he answered questions, with his usual incisive humour. Here was the Brains Trust at its best.

* * *

Pending the resolution of the political situation in Java there is no authority which can issue currency, so the zones we are holding struggle along with a variety of monies—Japanese and Dutch guilders, Malay dollars, Indian rupees, and so on. Of these the only official currency is Japanese guilders. Before the end of the war these were roughly equivalent to a Dutch guilder (2*s.* 8*d.*), but with inflation they are now worth a penny to three-pence according to which town you are in; 350 of these pieces of "banana" money (so-called because one denomination bears a picture of a bunch) are issued weekly to officers and 150 to men. They are all freshly printed notes, mostly in tens, and there is no serial number on them, but that does not seem to worry anybody. On one side of the note there is a depressed looking old man squatting against the rising sun. On the other side is the usual mass of whirls and squiggles that bankers the world over delight in. Traders will sometimes accept other money. Indian rupees are highly valued in Semarang (indeed one suave type was accepting cheques on the Bank of India, and writing polite notes to find out whether the accounts were covered). In Batavia Malay dollars are preferred, probably because there is so much shipping to Singapore. One could buy a carved Balinese head for 40 guilders when we first came in, but now even a small one costs 350. Silk is sometimes brought out as a great favour. But the silk I saw was wrapped round a board bearing the trade mark of an American firm, and anyway I think it was rayon.

* * *

Censuses always reveal a startling variety of occupations. Who would not be a professional Heckler (Textile, though—rather a pity) or in these times a Sugar Confectionery Boiler? Or perhaps get rid of his inhibitions, as so many seem to do nowadays, as a Mangler (Laundry)? To every occupation its own techniques and rewards, but if you want to see a rum one go and visit the louse-feeders at the Hamburg Tropical Institute. Nature has made lice choosy in their tastes, and only blood meals from the appropriate host will be cunningly transformed into good sound chitin and other pedicular needs. The louse colony thrives in its little flat wooden boxes, strapped to the forearms of the feeders, each box holding perhaps 50 inmates, and each provided with a gauze bottom for access to the larder. Rations are available twice a day. The feeders say that the irritation is not bad after a month or two.

The reason for maintaining a louse colony is not far to seek. Lice are as susceptible to typhus as guineapigs are to tuberculosis. A pure rickettsial strain can be propagated through generations of lice and multiplied manyfold. And this can be done by methods which obviate passage through the inconstant and sometimes cross-infected human. A sprawling louse, its upper end deftly muted by the edge of a cover glass, is easy meat for a capillary enema charged with a rickettsial suspension. After its incubation in the living host, a skilled worker can remove 500 heavily infected guts in an hour—some of them to reinfect the next recipients, the majority to be ground up and made into Weigl's vaccine for the protection of humans.

Perhaps one cautionary postscript should be added to check the rush of prospective louse-feeders: even infective lice have to be fed, so a necessary qualification for the job of louse-feeder is a previous attack of typhus.

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Letters to the Editor

THE BILL

SIR,—I am sorry that your leader of March 23 did not mention one aspect of the Bill which I believe to be vital not only to the profession but to the good name of the service—and of course these two are closely related. I refer to the provision which permits a general practitioner who is under contract in the service to treat a patient privately and charge fees, so long as that patient is not on his list. This, to my mind, is an encouragement and even a recognition of under-the-counter medicine. Surely, if we accept the service, it is up to us to see that it provides the best we can give. The public must not be under the impression that by paying to the same people an additional fee they can get something better. Under those conditions the service would start off damned from the very word "Go." We all know that patients under the National Health Insurance Acts have got good treatment; but we all know that, thanks to a very small minority of doctors, the public has got an impression that a private patient gets better treatment and more sympathetic consideration. It should be the aim of the service to abolish that, and it follows that if a doctor is within the service he should be within it exclusively.

I believe that 90% of the profession recognises at least that there is a need for coördination of the medical services and facilities, and that such coördination must be planned on a national basis. I believe also that the profession recognises that the barrier of price (payment per attendance), which too often today prevents the family doctor from playing his proper part in the *maintenance* of health, must be eliminated.

No Bill would be entirely acceptable; and, as you rightly point out, it is not so much the Bill that matters as the regulations under the Bill. Nevertheless we must start off with everything in favour of making the National Health Service the best that can be obtained. If we do not, then the name and reputation of the profession will suffer, and this will be not only to the detriment of the profession but also to that of the public.

ESSE QUAM VIDERI.

THE SUMMARY

SIR,—In addition to the Bill, the Ministry of Health has also published a Summary of the Proposed New Service (Cmd. 6761). Those who, because it is shorter and more intelligible, will prefer the Summary to the Bill should note that it is misleading in many points.

Sec. 20: ". . . the Minister is to consult . . . bodies representative of . . ." The Bill (1st schedule) commits the Minister to consultation only with ". . . such organisations as he may recognise as representative . . ."

Sec. 24: "Regional Boards, with their local Management Committees, shall enjoy a high degree of independence and autonomy within their own fields." But as the Bill contains no hint of this "object," the Minister cannot be held to its fulfilment.

Sec. 33: "Before making regulations he will consult . . ." This is nowhere mentioned in the Bill.

Sec. 41: "The professional" members of the council are to be "appointed by the local doctors, dentists and chemists through their own representative committees." The Bill, on the other hand, says that they will be appointed by a committee which the Minister "may recognise" where he is "satisfied" that such committee "is representative" (Bill, sec. 32 (1), and 5th schedule). There is a discrepancy here which does not favour democracy.

Sec. 44 states that participation in the service will not debar doctors from treating patients privately. There is no mention in the Bill of this freedom to continue private practice.

Section 46 speaks of "consultation with the doctors' professional representatives" in respect of terms and conditions of service or of remuneration. The Bill does not mention such consultation.

Sec. 56: The Summary does not say that doctors using the health centres will pay for them.

It is a remarkable Summary that, apart from errors of omission, includes by accident or design items not to be found in the document it purports to summarise.

Portsmouth. NIGEL CRIDLAND.

GROUP THERAPY

SIR,—The interesting article on Group Analysis by Major Foulkes (March 2) indicates the value of his method in the treatment of Army psychiatric casualties.

It occurs to me that the benefit to be derived from group discussions in the prophylaxis of psychiatric illness has not been sufficiently stressed. The unhappy, frustrated, perplexed, or disgruntled individual tends to exaggerate his difficulties and develop a neurosis if denied an opportunity to express them.

In India I had the privilege of talking to large numbers of soldiers under Toc H auspices. Subjects such as instincts, emotions, and simple psychological mechanisms were discussed. Members of the audience would then be invited to express their views. The first were usually those who spoke for the sake of airing their knowledge or put "devastating" questions unconnected with the subject under discussion. Before long, however, more retiring types expressed their difficulties with little reserve. As the meeting progressed, an atmosphere of intimacy developed, and the group effect became obvious. Many of those who came subsequently admitted that the meetings had helped them to understand situations and reactions which previously had caused them disquiet.

I felt that these meetings were of value in the prophylaxis of neurotic illness. Once a soldier had reached the stage of reporting sick, there developed, pari passu, a tendency to justify his action, which led to unconscious elaboration and dramatisation of his symptoms. By dealing, albeit superficially, with his problem before he had become overwhelmed by it, he was relieved without the loss of self-esteem which the admission of inability to carry on would have engendered.

Loss of self-esteem often preludes a lowering of standards, an acceptance of ideas of unworthiness, and a general deterioration. A vicious circle is set up, which is difficult to break. Prophylaxis is therefore important.

The same opportunities for the discussion of difficulties and problems might well produce comparable results in industry. It would, too, be interesting to investigate the psychopathology of strikes and other industrial disputes. It is easy to appreciate how accumulated grievances, frustrations, inferiorities, and unhappiness can lead to mass unrest; and it is likely that the faults which are projected on to pay and conditions often exist within the individual workers themselves. I strongly recommend group discussions on psychological lines as a means of promoting industrial efficiency and happiness.

London, W.1. ELLIS STUNGO.

TUBERCULOUS RHEUMATISM

SIR,—I read with interest Dr. Wilfrid Sheldon's article (Jan. 26).

The antistreptolysin titre of the serum is sometimes of help in the differential diagnosis between tuberculous rheumatism and streptococcal rheumatic fever. In a case of mine (*Ann. Rheumat. Dis.* 1944, **4**, 26) the titre was as low as 30; such a low figure is never found in true rheumatic fever.

S.E.A.C. E. MONTUSCHI.

AUTOPSIES FOR THE CORONER

SIR,—I believe that coroners are just as alive to the importance of postmortem examinations being conducted by a skilled pathologist as the members of the departmental committee, whose recommendation is quoted with approval in your leading article of March 16.

There is, however, one obstacle to a coroner's routine adoption of this practice: I refer to the statutory fee of two guineas, fixed by the Coroners' (A) Amendment Act of 1926, s. 23. Surely this is insufficient payment for a technical investigation and report which often provide decisive evidence of the cause of death; it deters some of us at any rate from enlisting the services of the skilled man as often as we should like, especially when the cost to him of travel and time are considered. A revised scale of fees for autopsies, commensurate with the pathologist's status as a specialist, would prove a boon to coroner and pathologist alike.

In the case upon which you comment, the question is posed, "Why should not the body have been sent to the postmortem room in the pathologist's hospital?" As a solution of the present unsatisfactory state of affairs

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this proposal has only a limited application. The bulk of hospital mortuaries are not equipped for the reception of some of the bodies within a coroner's jurisdiction, in that they are not provided with a cooling chamber. For example, a drowning case is usually subjected to autopsy, sometimes after prolonged immersion and consequent putrefaction. Apart from the transport to a distant hospital—an unpleasant task in these circumstances—a hospital mortuary lacking apparatus for refrigeration would not be a fit place for its reception; nor is it likely that any hospital committee would countenance such a transfer.

The indifference of some local authorities can be overcome by education about the provision of suitable accommodation; and the coöperation of skilled pathologists can be secured by the offer of reasonable pay. These, I submit, are among the desiderata of modern scientific medicine in the interests of the coroner's court.

Coroner's Office, South-East Lancashire, Ashton-under-Lyne. F. G. RALPHS.

MILESTONE IN ANÆSTHESIA

SIR,—We have for some time been engaged in an investigation of the action of *d*-tubocurarine in cases of traumatic paraplegia. We therefore read your annotation of March 23 with great interest and would like to comment on it in the light of our experience.

Your statement that "Prostigmin . . . has so far not had a striking effect in neutralising curarine in man" is against our experience. For instance, a patient who had received 40 mg. of *d*-tubocurarine intravenously and was showing extensive and alarming paralysis, including the respiratory muscles, was restored to normal power within a minute of being given 1·5 mg. of 'Prostigmin' intravenously. We feel sure that no anæsthetist's trolley should be without prostigmin ready for intravenous injection whenever curarine is being used.

Our impression, after a fairly extensive use, is that curarine is a dangerous drug. One of our patients who shows no weakness after 12 mg. intramuscularly is severely paralysed after 18 mg., so that the margin of safety is a fairly narrow one. We are shocked to witness the casual handling of the drug by some anæsthetists who are even unaware that drugs of the physostigmine group, and in particular prostigmin, are potent antagonists and should therefore always be at hand.

We believe that curarine is a very definite advance in anæsthesia but would like to endorse your final warning that "The enthusiast must not overstep the bounds of discretion in selecting cases for curarine lest the present boom be followed by a slump of discredit." And we would add that failure to use prostigmin to revive a patient from respiratory failure after curarine should be deemed gross negligence by any coroner.

L. P. E. LAURENT.
London, W.1. GILES ROMANES.

BIOLOGICAL EFFECTS OF HIGH-FREQUENCY CURRENTS

SIR,—It has been generally supposed that the effects of high-frequency electric fields on tissue, bacteria, viruses, &c., are merely the result of the rise of temperature which occurs. Nyrop [1] of Copenhagen now claims to have demonstrated specific electrical effects distinct from this heat effect. The experimental technique which he adopted is well suited to the investigation of such specific effects, and is one which will find increasing application. Instead of using a continuously applied field his energising current, of frequency 20,000 kilocycles per sec., was chopped periodically so that the successive current pulses were separated by current-free periods lasting 3–20 times as long as the current pulses themselves. In this way high field strengths could be applied during these short periods without producing an excessive overall rise of temperature and the normal heat effects.

When *Bacterium coli* in a liquid medium was treated at a field strength of 205 volts per cm., 99·98% of the bacteria were killed in 10 sec., whereas a similar effect produced by heat would require 600 sec. at 60° C.

Milk treated for 2·2 sec. at 340 volts per cm., or for 1·3 sec. at 620 volts per cm., acidified when kept afterwards for 18 hours at 35° C, in the same manner as milk previously heated to 75° C for 30 min. The results obtained were similar irrespective of whether the electrical treatment took place at temperatures between 6° and 36° or between 6° and 50° C.

Foot-and-mouth disease virus was completely inactivated when treated at 260 volts per cm. for 10 sec. (temperature not exceeding 36° C), or at 480 volts per cm. for 2·4 sec. To inactivate the same virus by heat a temperature of 37° C had to be maintained for 60 hours. Nyrop further states that whereas a virus inactivated by heat can be used as a vaccine, the virus inactivated electrically showed no vaccinating effect.

Preliminary investigations with *tissue cultures* demonstrated that it is possible to kill the tissue by the electrical treatment without raising the temperature above 30° C, by means of a field strength of 22 volts per cm. applied for 300 sec.; but Nyrop points out that the uniform treatment of the living tissue of entire organs, and the avoidance of skin injury, will present great difficulty.

As Nyrop remarks, these observations show that the electrical treatment which he imposed acts on the organisms concerned differently from ordinary heat treatment, but it may be doubted whether he is justified in inferring that his specific effects are not of thermal origin, notwithstanding the limited temperature rise of the test specimens which he records.

Two mechanisms may account for this rise of temperature, associated with the presence in the specimen of free ions or of molecular dipoles. The former result from the electrolytic dissociation of dissolved salts, &c., while the latter embrace all molecules which, because the centres of their constituent positive and negative charges do not coincide, behave like tiny electric dipoles. On the application of an alternating electric field the ions oscillate linearly and the molecular dipoles orient dumb-bell fashion—though with complex molecules only a part of the molecule may in fact be involved—at the frequency of the field. In both cases energy is extracted from the field and appears as heat.

The energy lost from both these causes shows itself externally in a general rise in temperature of the test specimen. The heat is actually generated, however, only in the immediate vicinity of the individual orienting molecules or oscillating ions, and these, generally speaking, will constitute only a small part of the entire system. The "instantaneous" temperature rise which occurs in the immediate neighbourhood of these molecules and ions may therefore be sufficient to destroy living tissue, though the heating of the system as a whole is too slight to have any effect. Indeed the only alternative to thermal action as an explanation of the effects observed—if it can strictly be regarded as an alternative—seems to be the fission of complex molecules by ionic impact, and this appears unlikely with field strengths such as Nyrop applied.

The dipolar energy loss is of considerable speculative interest. The ability of individual polar molecules to orient in sympathy with an applied field of given frequency is governed by the size of the orienting molecule or constituent polar group, and by what is conveniently called the viscosity of its environment. For any given system and magnitude of applied field strength the energy loss per cycle from this cause will be a function of the frequency, and will pass through a maximum value at a frequency which decreases with increasing size of the orienting dipole and increasing viscosity of the surrounding medium.

Now water, whose molecules are dipolar, exhibits a very pronounced peak of energy absorption at a frequency close to 10^{10} cycles per second. The much more complex and larger dipolar molecules involved in bacteria, &c., when present in water, may be expected therefore to exhibit maxima of energy loss at much lower frequencies, though if appreciable electrolytic matter is present this loss may well be dominated by that arising from ionic motion. This introduces the possibility of frequency selective action on particular bacteria, &c., which seems to justify investigation.

These arguments of interpretation are not intended to detract at all from the merit of Nyrop's work. The use of his technique, and of the frequencies much higher than 20,000 kc. per sec. which war-time developments have made available, justifies serious consideration by those interested in this field of medical research.

Electro-technical Laboratories, University of Manchester. WILLIS JACKSON.

1. Nyrop, J. E. *Nature, Lond.* Jan. 12, 1946, p. 51.

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NEW REMEDY FOR LUPUS

SIR,—Medical men will welcome the important contribution to the treatment of lupus vulgaris by Dr. Charpy, Dr. Dowling, and Dr. Prosser Thomas. Dr. Charpy's statement (March 16) that the disease has almost completely disappeared from France since 1941—presumably as a result of the use of calciferol—will encourage practitioners to emulate his success. It is to be hoped he will give us, through your journal, particulars of the preparation and dose he employs.

Remembering the success Rollier of Leysin has had from the use of heliotherapy in the treatment of tuberculous disease of bones, glands, and skin, it seems possible that calciferol will prove as effective in tuberculosis of bones and glands as it is in lupus vulgaris. It might be found, too, that in pulmonary tuberculosis the careful use of calciferol in high dosage is free from the dangers associated with heliotherapy. Cod-liver oil has already acquired a good reputation in this disease.

Charpy, Dowling, and Prosser Thomas do not mention the use of calcium concurrently with calciferol. Decalcification of tissues is said to be a concomitant of tuberculosis, and some might attribute the value of calciferol to its powers of recalcification. Injections of calcium have not been found of great value in pulmonary tuberculosis, but the fixative vitamin might be more important than the actual amount of calcium presented to the economy. Have the protagonists of calciferol for lupus vulgaris any theories on the matter?

Royal City of Dublin Hospital. E. HARVEY.

PSYCHOSIS AND DISSEMINATED SCLEROSIS

SIR,—The following case-history of a female patient, aged 51, has features of interest:

Aged 20, had an unsteady gait for about one week.
Aged 32, onset of psychosis, which lasted two years. This was diagnosed as dementia præcox until it terminated abruptly overnight.
Aged 42, diplopia, lasting about ten minutes.
Aged 44, psychotic interlude, lasting about eight weeks.
Aged 51, disseminated sclerosis now manifest, with characteristic neurological changes, including absent abdominal reflexes and bilateral extensor plantar responses; characteristic changes in the cerebrospinal fluid.

This is a good example of the extremely chronic type of disseminated sclerosis. The condition's association with euphoria, emphasised by the late Dr. Kinnier Wilson, is now generally recognised; its capacity to cause acute psychoses, though known to psychiatrists, is possibly less fully appreciated. No reproach can attach to the doctor who made the original diagnosis of dementia præcox in this case; but, viewed in the frame of 30 years' history, there can be little doubt that both psychotic attacks, which began and ended abruptly in a patient with a healthy personal and family history, were due to the neurological lesion.

M.D., M.R.C.P.

WHITHER MEDICINE?

SIR,—In your issue of March 23 Major Kessel makes some very sweeping criticisms of my earlier letter. It is unfortunate that his more detailed study of this letter has caused him to reach such erroneous conclusions. My plea was, as he originally thought, for a broader basis for all teaching and practice. To define philosophy as the science of thought might suffice for the Brains Trust but it is a definition which ignores the meaning of the word philosophy. The original meaning of the word—the love of wisdom—is something far deeper and more fundamental than the science of thought. The word science used in such a context has a more restricted meaning than the earlier *scientia* which covered all natural knowledge or the branch of philosophy known as natural philosophy. From natural philosophy have ceded other departments of natural knowledge such as chemistry, astronomy, and physics.

Surely then the scientific philosopher for whom Major Kessel asks is a much narrower person than the benign family doctor or the great wise Individual whom he scorns as out of date. Hamlet might remind him that not all in this life is capable of scientific explanation. Any man who deceives himself so far as to believe that the adequate application of the scientific method as we know it will give the answer to all things human and material has no great knowledge of the history of science, of medicine, or of thought. The origin of all religions is this realisation by man that he cannot explain everything.

Let us then have as much scientific medicine as is possible; but in our scientific quest let us ever remember that that presently much neglected part of man, his soul, has a right to consideration as well as the mechanics of his feet or the biochemistry of his brain. Dr. Guthrie (p. 405) has discussed a philosophy for medicine and has used philosophy in the same sense as I did in my original letter. I am as eager as Major Kessel for the onward march of scientific medicine, but I have unfortunately too often witnessed patients who became a series of laboratory exercises. To the doctors concerned it brought much interest, but the patients and their relatives did not share their enthusiasm. My philosophy might then be defined as the search for a sense of proportion.

Oxford. JOHN GRIEVE.

VAGINITIS DUE TO ENTAMŒBA HISTOLYTICA

SIR,—I first wrote this report in 1941, but the extension of war in the Far East cut off all means of communication. I now send it belatedly in the hope that it may interest the many who have recently seen so much amœbiasis.

CASE 1.—A woman, aged 60, was admitted in 1937 with symptoms of mild amœbic dysentery of 1 month's duration; she had had one similar attack several years before. A few days before admission she noticed a glairy vaginal discharge which was becoming more profuse. She was then passing 4–6 loose stools daily and complained of abdominal pain. There was no pyrexia. Vaginal examination showed inflammatory œdema in the introitus vaginæ, extending up the posterior vaginal wall where there were ragged ulcers and thick granulations; there was no fistula and no sinus; the cervix appeared normal. The whole vagina was covered with creamy pus, all specimens of which contained many actively motile amœbæ, which in their movements, size, structure, and the included red cells resembled *E. histolytica*. The fæces, however, repeatedly showed only amœbic cysts. The urine was normal. There was no cutaneous ulceration. Within a week of starting treatment with emetine and daily douches of copper sulphate solution (1 : 5000) the discharge had entirely ceased, and the granulation tissue was much reduced. The diarrhœa had also stopped, and the patient left hospital a week later, apparently cured entirely of the vaginitis.

CASE 2.—In 1941 a woman of 41 was admitted, complaining of leucorrhœa, with a painful swelling in the vulvar region for 10 days. She gave no history of previous dysentery in herself or her family, and her bowel movements were normal. The vulva was œdematous, red, and ulcerated on the inner surfaces of the labia, the ulcers were shallow, dirty, rather undermined, and tender. The vagina was filled with glairy sanio-purulent discharge, and when this had been removed the whole length of the vagina was seen to be likewise covered with small ulcers, some of which had become confluent; the cervix was reddened but not ulcerated. On admission the temperature was 101° F, the pulse was rapid, and the patient was in considerable distress. The urine contained a trace of albumin but no organisms. The stools were repeatedly negative for motile and encysted amœbæ; but the pus from the fornices of the vagina repeatedly showed numerous motile amœbæ, typical of *E. histolytica*, while stained smears revealed no other pathogenic organisms. The rectum and sigmoid colon appeared normal on sigmoidoscopy, and there was no fistulous communication with the vagina. Injections of emetine and vaginal douches of 1% chiniofon led to improvement in 4 days, after which the whole condition cleared rapidly. The patient insisted on leaving hospital after 8 days, since she considered herself cured; by that time the ulcers were clean and healing, and no amœbæ could be demonstrated.

I can claim no special experience in the identification of *E. histolytica* apart from that obtained by working in an area where amœbic dysentery is endemic. But the appearances in both these cases seemed quite typical of that organism, and the response to specific treatment was rapid and apparently complete. Through a personal communication from the Philippine Islands I have learnt of a similar case, where a biopsy from the granulomatous tissue in the vagina showed entamœbæ in the tissue itself. I should be interested to know whether vaginitis due to *E. histolytica* is actually rare, or whether it is generally overlooked. I can find very little reference to it in the standard textbooks.

Methodist Hospital, Fatshan, South China. J. R. ROSE.

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Parliament

ON THE FLOOR OF THE HOUSE

REPORTS which appeared in most papers on March 22 about impending cuts in fats and in soap were the winged message that came in advance of Sir Ariel Ben Smith's flight across the ocean from the U.S.A. They caused enough alarm and despondency to justify a war-time charge against somebody. Sir Ben explained on March 25 to the House of Commons that there was no departmental difference of opinion on this. The next day, however, he admitted that "a regrettable error was made" but steps had been taken to see it would not happen again, and out of these inquiries emerged the promise of a white-paper on the food situation to be produced on April 2 and followed by a full-dress debate on April 5.

Food, fuelling, and building materials dominated the first two days of the week. A Bill to speed up the acquisition of land came next, and food and housing appeared again on the fourth day when the Minister of Education announced that from August milk would be provided free in primary and secondary schools. Priority is to be given to building school canteens so that all school meals can also be provided free as soon as possible. These contributions in kind are necessary, for family allowances have been fixed at a rate which needs to be made up to a higher level.

The reaction to the National Health Service Bill in the House continues to be good. The opposition will be in the form of a "reasoned amendment," which is as much as to say "there is good in it, but . . ." The arguments are to be on the buts and not on the main structure.

MEDICUS, M.P.

FROM THE PRESS GALLERY

Casualties on the Roads

On the motion for the adjournment in the House of Commons on March 25 Mr. T. C. SKEFFINGTON-LODGE described road accidents as one of the major social evils in our national life. From enemy bombs the average daily casualties in Great Britain during the war were 29 killed and 40 seriously injured, a total of 69. From road accidents the average daily casualties were 16 killed and 100 seriously injured, a total of 116. During the war some 44,000 people were killed on the roads and over 750,000 injured. Since the restoration of the basic petrol ration the position had become even more serious. The cost to the nation of these appalling casualties was something like £100 million a year. Of the children killed, two-thirds were under 7, and nearly half were 5 or under. He did not believe that the remedy was purely physical, though there were many practical measures which could be taken. But fundamentally it was a human and psychological problem. There was a deplorable tendency today to think far too much in terms of masses, and far too little in terms of the individual. The sanctity of human life meant little or nothing to many people. We needed to be more imaginative about our neighbours' troubles. He urged that stiffer driving tests should be imposed; that men and women coming out of the Forces should be given some dramatic leaflet asking for their help in reducing the toll of the roads; that more police should be detailed for crossroads duty and mobile patrols; and that the Minister should consider the speed of motor vehicles and the more rapid development of road construction.

Mr. G. STRAUSS, parliamentary secretary to the Ministry of War Transport, said that the Government hope to reintroduce driving tests in the autumn, although in his view their usefulness could be exaggerated. He believed that no single action which could be taken was more potent than the wide use of mobile patrols. Many of our roads were in an exceedingly bad condition, and the task of improving them would be tackled as soon as possible. The new Highway Code was similar to the previous one, but it was brighter and more easily read. After submission to Parliament the new code would be delivered to every household in the country. The Government realised that there was going to be in the coming months a considerable increase in traffic; they were tackling it on a psychological level as they could not do it yet on a material level. A quarter of a million pounds had been allocated to the Road Safety Campaign which it was hoped would produce substantial results.

Wheat Extraction-rate

In the House of Commons on March 27 Mr. C. S. TAYLOR protested against the increase in wheat extraction from 80 to 85%. As a layman he wished to know what difference there would be in the nutritional value of the bread. In war-time wheat extraction was raised to 85% as a necessity. Was it a necessity now, and were the Government trying to teach the people of the country what sort of bread they should eat? He suggested that the people should be given what bread they liked, whether white or brown. Moreover, if the wheat extraction was raised there would be less chicken food, and that was bound to have an effect on the production of shell eggs. Dr. EDITH SUMMERSKILL, parliamentary secretary to the Ministry of Food, said that the decision to increase the extraction-rate was announced by the Minister on Feb. 5, on his return from Washington. He pointed out at that time that there was a grave deficit—about 5 million tons—of wheat. All importing countries had to make heavy sacrifices, and this country had accepted a reduction of nearly 250,000 tons for the first half of 1946. This reduction could not be met out of stocks, but only by increasing the extraction-rate. To avoid a run on stocks due to a possible desire on the part of the public to stock up with flour of a lower extraction-rate, it was decided that no public announcement should be made of the dates on which the new rate should come into operation. The change was made in two stages * to avoid a sudden change in the appearance of the flour. If the Ministry of Food had gone suddenly from "near white" to darker flour it would have been unpopular, and the public would not have accepted it as they had accepted the new loaf today.

Nuclear Energy and Medical Research

Speaking in a debate in the House of Commons on March 28 on the industrial development of atomic energy, Mr. MARTIN LINDSAY said the provision in large quantities of radioactive substances would be of great value both for medical and biological research. He asked the Minister of Supply if he was satisfied that sufficient priority was being given to this most important subject, and whether there were any Treasury restrictions upon its development. Mr. A. R. BLACKBURN said he was sure that the most immediate benefit to be derived from atomic energy would come not from power but from medical research and therapy. Prof. Charles Ellis had said:

> "The radioactive substances which can now be made by these new atomic processes will provide complete and adequate substitutes for radium on a scale hitherto undreamed of. In some respects, they are superior as healing agents. A wider choice of radiations will be available to the physicians and a variety of the chemical properties to which the radioactive powers can be allied will provide a refinement of technique which is bound to produce valuable results."

Prof. E. O. Lawrence had stated that the first use to which the giant cyclotron in California would be put was research into the treatment of cancer, and he expected to see valuable results within the next two or three years. Nobody would suggest that a universal cure for cancer was likely to be produced, but it was necessary here to divide therapy from research. By the use of radioactive isotopes, which could be either fed or injected, it would be possible for scientists to discover the metabolism of the human body as they had never been able to discover it in the past. A radioactive element of a half period of 100 years could be detected down to one thousandth of one millionth of one millionth of a gramme. That meant that the cellular structure of the body could be examined in a living state, and it would be possible for scientists to discover what made a cell grow.

Mr. JOHN WILMOT, Minister of Supply, in his reply to the debate, agreed that there were likely to be benefits

* The extraction-rate was raised to 82½% on Feb. 24 and to 85% on March 10.

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to medical science resulting from the use of artificially produced radioactive materials which came, as it were, as by-products from the production of atomic power. British scientists had made an immeasurable contribution to this great service and it had been decided that as much of the resources of this country as possible should be devoted to the development of this work. The central planning was in the hands of the Prime Minister and the Cabinet, advised by the learned advisory committee presided over by Sir John Anderson.

QUESTION TIME

National Health Service Bill

Mr. G. HOUSE asked the Minister of Health, in view of the fact that the B.M.A. were given full details of the Health Service Bill before that Bill was made generally available, why similar opportunities for prior consideration of the details of this Bill were not given to other bodies of health practitioners such as osteopaths, naturopaths, chiropractors, and herbalists.—Mr. A. BEVAN replied: In preparing the health service proposals I consulted various groups of professional people who were qualified to advise me on the issues involved—and who, indeed, did include herbalists. There was never any question, however, of giving advance details of the Bill to the British Medical Association as such, or to any similar body, before it was presented to Parliament.

Doctors' Remuneration

Mr. H. GAITSKELL asked the Minister whether the salary and capitation fees to be paid to doctors taking part in the National Health Service would be affected by the number of private patients, if any, whom they treated.—Mr. BEVAN replied: If the Bill now before the House is passed into law, these will be matters for discussion when subsequent regulations are being drawn. I do not think I can attempt to anticipate them now.

Hospital Regions

Colonel M. STODDART-SCOTT asked the Minister whether he would place in the library a map showing the hospital regions he had in mind in the National Health Service Bill and the medical schools with which they were associated.—Mr. BEVAN replied: The manner of defining the proposed hospital regions is under consideration, and I am not at present in a position to adopt this suggestion.

Release of E.H.S. Beds

Mr. B. JANNER asked the Minister how many beds in infirmaries and hospitals were being held vacant for military patients; and whether he would consider releasing these as quickly as possible in view of the shortage of beds available in hospitals for civilians.—Mr. BEVAN replied: The number of beds reserved in civilian hospitals and institutions in England and Wales for the purposes of the Emergency Hospital Scheme is approximately 53,000. No part of this total reservation is earmarked exclusively for military patients, but the latest available figures show that of these beds 15,800 are occupied by Service patients and 10,700 by civilian patients who are the responsibility of the E.H.S., leaving approximately 26,500 vacant emergency scheme beds, the majority of which are unstaffed. The E.H.S. bed reservation figures are under constant review, and if hospital authorities find it necessary to encroach upon the emergency reservation, they are at liberty to do so in agreement with the responsible medical officers of my department. It is hoped to release a substantial number of beds after June 1, when it is expected that the Army's need for civilian hospital services will be limited to exceptional cases which cannot be provided for in military hospitals.

Shortage of Nurses

Sir THOMAS MOORE asked the Minister how many nurses were still required to man the civil hospitals of the country; how many had been released from the Forces in the past six months; and how many still remained in the Services.—Mr. BEVAN replied: On March 11, 1946, there were approximately 28,000 vacancies notified to the Ministry of Labour and National Service for nurses of all grades, in hospitals and similar institutions in Great Britain. During the six months ending Feb. 28, 3239 trained nurses were released from the Forces. I understand that the number still in the Services is 8973.

Proprietary Medicine Claims

Mr. N. NALLY asked the President of the Board of Trade whether he was aware that conditions in the near future would permit expansion in production of certain patent medicines, foods, and wines for which health-giving properties were claimed; and whether he would take action to ensure that the selling price of such products would bear a close relationship to their real value.—Mr. J. W. BELCHER replied: Medical substances for personal and domestic use, and invalid foods and requisites in relation to such foods, are price-regulated goods subject to the Prices of Goods Act, 1939, under which the prices charged may be increased only to the extent of increases in costs for comparable goods since Aug. 21, 1939. I am not prepared, on the information at present before me, to take special steps to fix maximum prices for these goods. Wines and foods, except to the extent that they fall within the above description, are not price-regulated and are the responsibility of the Ministry of Food.

Mr. NALLY asked the Minister of Health whether he would have periodic examinations made of claims in press, periodical, and other advertisements, as to the health-giving properties of patent medicines, foods, and wines, and would take effective steps to keep the public informed of the results of such examinations.—Mr. BEVAN replied: As regards patent medicines, I do not think that anything really useful on these lines could be done without further legislation—which would be complicated and is out of the question for the time being. As to foods, the question should be addressed to the Minister of Food. Pressed further, Mr. Bevan promised to look into the matter again. He was sympathetic towards Mr. Nally's intention and agreed that the public ought to be protected. That, he added, might be one of the advantageous by-products of a National Health Service.

Ex-Service Personnel and Aural Disease and Deafness

Mr. EDWARD EVANS asked the Minister of Pensions if he would state the number of personnel in receipt of disability pensions on account of aural disease or deafness.—Mr. WILFRED PALING replied: Approximately 15,500 awards of compensation have been made to persons suffering from disablement due to aural disease or deafness arising out of the 1939 World War.

Replying to a further question by Mr. Evans, Mr. Paling said deafness of any type or category due to war service was accepted for pension purposes.

Release of Medical School Buildings

Mr. HAYDN DAVIES asked the Minister of Works (1) whether he would now give a date on which the Admiralty requisitioning of the physiology department of University College medical faculty would end, so that the college authorities could proceed with plans for the next academic year; and (2) whether he would now give a date on which the requisitioning of the anatomy building of University College medical faculty for the infestation branch of the Ministry of Food would end, so that the college authorities could proceed with plans for the next academic year.—Mr. J. H. WILSON replied: Release will take place in stages, beginning, it is hoped, at the end of next month.

Priority for Doctors' Cars

Mr. R. BOOTHBY asked the Minister of War Transport whether he was aware that medical practitioners in the country districts of Scotland were unable to obtain motor-cars to carry out their work; and whether he would restore the priority system in cases where the possession of a motor-car was essential in the national interest.—Mr. A. BARNES replied: I do not think that it is necessary or practicable to restore the priority system but I am reminding manufacturers of the importance of giving preference to applicants needing cars in the national interest. All holders of licences under the old system are entitled to priority in delivery.

"... I think I speak for public opinion in general, when I say to the Government: 'Tell us the facts in official statements month by month that we may know how things are going. Do not apologise for asking us to save, to accept restrictions, to make sacrifices. Ask and we willingly support you.' ... Only governments can cope with this world famine, but they will only do it adequately if they agree on what is fair distribution and have the backing and pressure of their peoples to secure it. 'Fair distribution' means a good deal more than just saying that Germany must come last in the queue. Everything that can be done to ensure food essential for life for all peoples, even for those last in the queue, must be done, and it is for us to assure our Government that we are ready and anxious to answer every call for care and for sacrifice which they make upon us."—The ARCHBISHOP OF CANTERBURY, quoted in *Manchester Guardian*, March 20, p. 8.

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Obituary

GILBERT EDWARD MOULD

M.R.C.S.

Gilbert Mould, who died at Sheffield on March 16, was a son of the late Dr. G. W. Mould, superintendent of Cheadle Royal, and he devoted himself to his father's specialty. From Cambridge he went to St. Mary's Hospital, London, where he qualified in 1894. After holding resident posts there, he became assistant medical officer at various mental institutions, before becoming superintendent of The Grange, near Rotherham, where he remained to the end of his life. For several years he was physician for mental diseases to the Sheffield Royal Hospital, and later to the Rotherham Municipal Hospital, and he was valued by his colleagues for his ripe experience and sound knowledge of mental diseases. A keen sportsman, he was well known in the hunting-field, and his holidays were always spent fishing in Scotland.

BENJAMIN RIGBY JOHNSTON

M.D. BRUX., M.R.C.S., L.R.C.P.I.

Dr. B. R. Johnston, who died at Grasmere at the age of 84, was educated at Rossall School, Dublin, and Brussels. In 1884 he took the Irish and English conjoint qualifications, and six years later the M.D. of Brussels. After holding hospital appointments in Ireland and making a trip as ship's surgeon to the Far East he came to England to act as assistant to Dr. Floyd, of Birkenhead. In 1888 he moved to Grasmere where he was still in practice at his death 58 years later. Outside medicine his interests were literary and archæological, and he was secretary to Dove Cottage and the Wordsworth museum. But he identified himself with every good activity of the village, and in the words of the country folk "Dr. Ben was the most useful man in Grasmere for fifty years." His brother, Dr. G. Ainslie Johnston, of Ambleside, survives him.

PROF. MAITLAND RAMSAY

Prof. W. J. B. Riddell writes: Dr. Maitland Ramsay died in his 87th year. He was born a few years after the discovery of the ophthalmoscope and grew up during the period of intense intellectual activity resulting from the work of the great Victorians. He was old enough to have seen a cataract extraction performed prior to the introduction of cocaine and well remembered the first occasion upon which the drug was used. Many honours and distinctions were granted to him during his long life and he maintained the greatest interest in the work of his younger colleagues until the very end. I received many letters from him inquiring about the application of modern methods such as penicillin and sulphonamide drugs to the treatment of eye disease. All his life he was enthusiastically devoted to the search for remedies which might alleviate suffering and cure disease. He followed the great tradition of general physicians such as Clifford Allbutt, James Mackenzie, and William Osler, and he had an unbounded admiration for his own old teachers in the University of Glasgow. He delighted in the thought that his chosen subject received academic recognition in his own university almost 120 years ago when a lectureship was founded, whose first incumbent was the celebrated William Mackenzie. When at a later date a chair was instituted he followed its fortunes with interest and understanding.

On Active Service

CASUALTIES

MISSING, NOW PRESUMED DEAD

Surgeon Commander THOMAS CRAIG STEVENSON, O.B.E., M.B. Camb., R.N.V.R.

Commander Stevenson is officially presumed to have lost his life at the sinking of the S.S. *Ban Ho Guan*, on Feb. 28, 1942, in Sumatra waters.

WOUNDED

Captain S. J. T. MERRYFIELD, M.R.C.S., R.A.M.C.

AWARDS

D.S.C.

Surgeon Lieut.-Commander S. E. L. Stening, M.D. Sydney, F.R.A.C.S., R.A.N.R.

Notes and News

NURSES AND THE BILL

THE Royal College of Nursing says that it considers the National Health Service Bill an improvement on the original white-paper as far as nursing is concerned. It welcomes the fact that nursing will have its own standing advisory committee at the national level, with direct access to the Minister; but it will continue to press for adequate nurse representation at the regional and local levels. On the whole it approves the machinery for bringing the whole hospital service directly under the control of the Minister; "this should obviate overlapping, should lead to a more economic use of small hospitals, to improved institutional care of chronic and long-stay cases, and to closer coördination between the mental and physical health services." It welcomes the provision for an extended domiciliary nursing service, but holds that the local health authorities should be under statutory obligation, as in the domiciliary midwifery service, to consult with the voluntary agencies concerned, and wherever possible to provide the service through them. Finally, urging a complete overhaul of local-government machinery, the college advocates a public-health nursing department for each local health authority, under the direction of a chief nursing officer charged with coördinating the clinic, domiciliary, and welfare nursing services and preventing redundancy and overlapping. The head of the nursing department should have the status of a hospital matron, with access to appropriate hospital committees on all matters within her sphere.

A NEW CAMPAIGN AGAINST DIPHTHERIA

THE 1945 campaign for immunisation against diphtheria, supported by more than 300 local drives, was so successful that the Ministry of Health is continuing it this year, in the hope of reaching the target—protection of 3 out of every 4 children. Some 6 million children have already been immunised, but at least 3 million are still unprotected; and of course the numbers immunised each year need to keep pace with the numbers born. A well-designed brochure, issued for the Ministry of Health by the Ministry of Information and the Central Council for Health Education, has been distributed to local authorities. It advises them in planning local campaigns and describes or illustrates the help which can be given them. Posters, films, cinema slides, leaflets, and illustrations for press advertisements are ready for those who apply for them, and the brochure encloses specimens of various useful cards and leaflets—a parents' consent form, a health visitor's card, a birthday card for the one-year-old, order forms for advertising material, a leaflet reprinting part of Sir Wilson Jameson's broadcasts, and others setting out the important facts about diphtheria. The illustrations are mainly of healthy cheerful children; only one picture attempts to excite alarm and despondency, and even in that the child, since he appears to be attended by Dr. Guy Dain, probably has a good chance of recovery. For British propaganda, all the material is unusually pleasing and informative.

"SAVE EUROPE NOW"

WITH the aim of relieving starvation in Europe, the promoters of this movement have issued a six-point programme. (1) Stocks of food in this country, estimated as 3,550,000 tons, should be reduced to the 3,000,000 tons at which they stood in September, 1939. (2) Bread should be rationed. (3) The extraction-rate of bread should be raised from 85% to 90%; this would save about 250,000 tons of grain a year. (4) The amount of grain used for brewing beer should be reduced from the estimated annual total of 800,000 tons. (5) The making of cakes, biscuits, and confectionery should be temporarily decreased or discontinued. (6) Other proposals advanced last autumn, such as the surrender of coupons for meals in restaurants, should again be considered. The address of "Save Europe Now" is 14, Henrietta Street, London, W.C.2.

IMPROVED FEEDING-BOTTLE TEAT

Mr. B. THEODORE BERY writes: Owing to the necessity of transferring my baby from natural to artificial feeding I decided to attempt to overcome the obvious defects of ordinary bottle teats. The accompanying half-scale figure illustrates the design which has proved extremely satisfactory. It is modelled on the human breast and was produced from an impression taken from a well-formed breast in a hydrocolloid. A stone cast was made, and from this a wax teat, from which tin moulds were made. From these moulds the teats were processed in polyvinyl chloride resin devoid of

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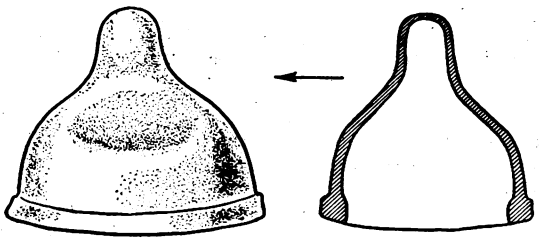
toxic plasticisers, the thickness varying according to the resistance required. This resin is better for the purpose than rubber, the principal advantage being that it can be boiled for long periods without any appreciable alteration in substance or shape. It is inert to acids, alkalis, and sunlight, is easily cleansed, and offers the same resistance to pressure as does the human breast.

The teat is designed with two sides slightly flattened and softer; if the baby is a slow feeder, the teat is turned so that



he grasps these sides which offer less resistance to pressure. If the infant is a fast feeder, the chin presses against the bulbous portion of the teat, thus inhibiting the movement of the mandible.

Four or more small holes are pierced in the nipple of the teat, which is attached to the end of a wide-necked feeding-jar, without a valve at the end. The reason for using a bottle with only one opening is that the milk is expressed by the action of the muscles of mastication on the body of the teat. The atmospheric pressure inside is maintained by holding the bottle upright periodically to enable air to enter through the nipple, or by lifting the rim of the teat away from the side of the bottle.

If the breast-fed baby derives any assistance in bone development from the munching or chewing action and from the force exerted on the facial bones by the *body* of the breast during feeding, the bottle-fed baby should obtain similar advantages from this teat.

University of Cambridge

On March 16 the following degrees were conferred:

M.D.—A. S. Hollins, J. C. P. Grey, G. B. Leyton, A. M. Lester, and Ralph Kauntze.

M.B., B.Chir.—F. S. Hubbersty, D. G. Davidson, P. P. Philip, R. E. Gruchy, J. E. Pitts, P. H. Walker (all by proxy), T. A. Evershed, and R. I. G. Coupland.

M.B.—W. E. Tucker.

University of London

Sir Francis Fraser, professor of medicine in the university, has been appointed director of the British Postgraduate Medical Federation, which is being set up to coördinate and develop the facilities for postgraduate medical education in London.

Dr. Alexander Haddow has been appointed to the university chair of experimental pathology, tenable at the Royal Cancer Hospital (Free) as from Oct. 1.

Dr. Haddow was educated at Broxburn High School and the University of Edinburgh, where he graduated M.B. in 1929. He proceeded to the PH.D. and M.D. (for which he was awarded a gold medal) in 1937, and the D.SC. in 1938. After qualifying, he acted as house-physician at the Royal Infirmary, Edinburgh, and held a Carnegie research studentship in bacteriology, a Davidson fellowship in immunity, and the Laura de Saliceto studentship of the University of London. In 1931 he was appointed lecturer in bacteriology in the University of Edinburgh. He published a number of papers on the pathology of growth, and on the phenomena of dissociation and variation of bacteria. In 1935 he described a growth-retarding property characteristic of many carcinogenic compounds, and more recently he has reported on the carcinogenic activity of derivatives of aminostilbene, the effects of synthetic œstrogens in malignant disease, and the rôle of various *iso*-alloxazines in the artificial induction of animal pigmentation. Dr. Haddow has carried out much of his research with the support of the British Empire Cancer Campaign, and since 1940 has been a member of the staff of the Chester Beatty Research Institute of the Royal Cancer Hospital (Free), London.

Dr. A. C. Stevenson has been appointed to the university readership in public health, tenable at the London School of Hygiene and Tropical Medicine. Dr. Stevenson has been deputy medical officer of health at Wakefield since 1937.

The title of reader in pharmacology in the university has been conferred on Dr. H. O. Schild, in respect of the post now held by him at University College.

THE Central Medical War Committee announces that Mr. C. DEE SHAPLAND, F.R.C.S., has resumed civilian practice at 15, Devonshire Place, W.1 (Welbeck 5656).

University of Sheffield

At recent examinations the following were successful:

M.D.

Harry Cullumbine.

M.B., CH.B.

D. E. Hobday, S. M. Patel, and Pamela M. Smith.

Medical Diary

APRIL 7 TO 13

Monday, 8th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2

5 P.M. Mr. L. E. C. Norbury: Surgery of the Rectum, with special reference to Malignant Disease.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1

5 P.M. *Odontology.* Mr. Edgar Manley, Dr. Margaret Murray, Dr. Paul Pincus: Dental Structure and Dental Caries.

Tuesday, 9th

ROYAL SOCIETY OF MEDICINE

5 P.M. *Psychiatry.* Discussion: Prefrontal Leucotomy with special reference to Indications and Results.

CHELSEA CLINICAL SOCIETY

6.30 P.M. (South Kensington Hotel, Queen's Gate Terrace, S.W.7.) Dinner meeting. Dr. Charles Hill: Medicine and the State.

Wednesday, 10th

ROYAL COLLEGE OF SURGEONS

5 P.M. Prof. H. J. Seddon: Peripheral Nerve Lesions.

ROYAL SOCIETY OF MEDICINE

4.30 P.M. *Physical Medicine.* Dr. P. Bauwens, Dr. W. Beaumont, Dr. C. E. Iredell: Evaluation of Actinotherapy.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1

3.30 P.M. Mr. A. H. McIndoe: Surgical Responsibility in Relation to Injury.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace Road, S.W.1

2.30 P.M. Dr. J. Greenwood Wilson, Miss Dorothy Manchee: Compulsory Notification and Treatment of Venereal Disease.

UNIVERSITY OF GLASGOW

8 P.M. (Department of Ophthalmology.) Dr. I. C. Michaelson: Kerato-conjunctivitis.

Thursday, 11th

ROYAL COLLEGE OF SURGEONS

5 P.M. Surgeon Rear-Admiral Sir Gordon Gordon-Taylor: Surgery of the Colon.

ROYAL SOCIETY OF MEDICINE

5 P.M. *Ophthalmology.* Dr. Noelle Chomé: Behaviour and Mirror Writing in Twins (film). Mr. Ferdinand Kayser, Mr. John Foster: Optical Control of Sharp Ophthalmic Instruments. Cases will be shown (at 4.30 P.M.).

Friday, 12th

ROYAL SOCIETY OF MEDICINE

5 P.M. *Clinical.* (Cases at 4 P.M.)

Saturday, 13th

MIDDLESEX COUNTY MEDICAL SOCIETY

3 P.M. (Hillingdon County Hospital.)

Births, Marriages, and Deaths

BIRTHS

ALEXANDER.—On March 28, at Cheltenham, the wife of Dr. Angus Fraser Alexander, R.A.M.C.—a son.

CAVE.—On March 23, at Crediton, the wife of Dr. Mark Cave, Gold Coast—a daughter.

CHESHIRE.—On March 26, at Wolverhampton, the wife of Surgeon Lieutenant A. H. Cheshire, R.N.V.R., of Brewood, Staffs—a son.

COOPER.—On March 28, in London, the wife of Dr. J. F. Cooper—a son.

FAIRLIE-CLARKE.—On March 23, at Newbury, the wife of Mr. G. A. Fairlie-Clarke, F.R.C.S.—a son.

FRANKLIN.—On March 24, in London, the wife of Dr. A. White Franklin—a daughter.

HERBERT.—On March 23, the wife of Dr. George Herbert, of Worksop—a daughter.

JAMES.—On March 19, the wife of Mr. Kenneth L. James, M.S., of Croydon—a daughter.

MCCARTER.—On March 27, in London, the wife of Dr. G. R. B. McCarter—a daughter.

MURCHISON.—On March 25, at Southampton, the wife of Surgeon Lieutenant-Commander Murchison—a son.

SMITH.—On March 22, in London, the wife of Dr. W. H. Roderick Smith—a daughter.

SWAN.—On March 23, at Shawford, the wife of Flight-Lieutenant J. F. Swan, M.R.C.S.—a daughter.

MARRIAGES

HALE—GANGE.—On March 19, at Kiambu, Kenya, George Samuel Hale, M.B., to Gwendoline Maud Gange.

HARRISON—EDEY.—On March 23, at Guildford, Thomas Bennett Harrison, major R.A.M.C., to Nicolette Edey.

PARKINSON—OVERTON.—On Feb. 16, at Kimpton, Charles Frederick Colville Parkinson, surgeon lieutenant R.N.V.R., to Helen Grace Overton.

DEATHS

COOKE.—On March 28, at Hendon, Ebenezer Hunt Cooke, M.A., M.B. Camb., aged 82.

EZARD.—On March 25, at Farnham, Surrey, Edward Henry Ezard, M.A. Camb., M.D., D.SC. Edin., aged 81.

JOHNSTON.—On March 17, Benjamin Rigby Johnston, M.D. Brux., M.R.C.S., L.R.C.P.I., aged 84.

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PLACE OF MEDICAL SOCIETIES IN THE DOCTOR'S LIFE *

Sir HENEAGE OGILVIE
K.B.E., D.M., M.Ch. Oxfd, F.R.C.S.
SURGEON TO GUY'S HOSPITAL AND CONSULTING SURGEON TO THE ROYAL BUCKS HOSPITAL, AYLESBURY

A NEW society has been born, adding the name of the Mid Bucks to those of the many medical societies, some of them nearly 200 years old, which are a peculiar feature and a particular glory of British Medicine.

I might ask first of all why this society has been formed. Do we need it? Have we not got our family circle, our friends, our golf clubs, and our social clubs to enliven our hours of leisure? Have we not got books and journals, the British Medical Association, the Royal Society of Medicine, and the Medical Society of London, the many lecture courses which are open to us at the colleges, and the refresher course which hospitals organise for our benefit, to give us instruction? We have all these. But a medical society supplies something different. It fills a spiritual need that is otherwise unsatisfied. It offers corporal and intellectual sustenance of a kind that cannot otherwise be obtained.

The functions of a medical society are social and educational, and of these the first is undoubtedly the more important, because it leads naturally to the second. Doctors are all members of the same ancient and honourable profession. They are also rivals in the same anxious and onerous business, often overworked, and at the end of a day overtired and prone to shut themselves in their own houses with their own anxieties, and sometimes with their own fancied grievances against a brother practitioner over some misunderstanding which has never seen the light of personal encounter. Unity and friendship among the doctors of a district is most easily brought about by the pleasant and free intercourse which a well-conducted dinner meeting of a medical society provides.

Here they can meet without the formality that attends the gatherings of a larger body, the majority of whose members are strangers to each other. Here they can discuss medical matters to their hearts' content without the guilty feeling, always present at a non-medical party, that they are talking shop. Here the practitioner can repair after he has finished his busy surgery, and meet his friends and rivals over a cocktail or a glass of sherry, and, equally important, his wife can meet the wives of his friends and rivals. Misunderstandings are cleared up, suspicions and animosities melt away. If a good dinner follows, and an easy address and discussion, many men will find themselves ready to get up and speak freely of their experiences without that reserve and uneasy boastfulness that affects them at many of the formal discussions. Thus the social functions of a medical society lead naturally to the educational, because without a broad and tolerant frame of mind a doctor cannot be educated or, rather, he cannot educate himself.

True education is personal experience built up by trial and contemplation into a personal fabric of knowledge and wisdom. We are taught by books and lectures. We learn—that is, absorb into the fibre of our being—what we find out for ourselves, or think we do.

A man who writes a book or a man who gives a public lecture is committing his reputation to cold print, or to the ears of critical strangers. He must above all be accurate. He cannot give expression to those half-formed ideas that are uppermost in his waking moments, to those dreams that he hopes will one day become realities and shake the world. His facts are as clear-cut as the pyramids, because they have stood the test of time; his arguments are unshakable, because they have been shaken so repeatedly in the winnowing process of preparation that they have assumed a static form and a set order; his conclusions are as right as rain—and about as wet. Such books, such lectures, flow over our minds like water over the bed of a river, sometimes impinging on them so forcibly as to change the direction of their channel, usually doing no more than rattle the stones. But it is in discussing the book with friends, in the debate of small groups before the lecture starts, or in the arguments after it is over in which the lecturer, a changed man once he has stepped from the platform, takes part, that we thrash out those beliefs that will remain with us and guide us in the years to come. It is in the sharing of inspirations yet untested, in defence or attack of theories struggling for definition, that learning is advanced and ideas are born.

* * *

This problem of self-education is one that faces each of us individually. It is one that I had to face twenty years ago when I found myself standing on the high diving board of surgical registrar, secure, poorly but regularly remunerated, happy in the consciousness of honours and high degrees recently gained, and looking down on the cold and opaque waters of surgical practice into which I must now plunge. How could I transform myself from a surgical oracle to whom students must listen into a wise surgeon whom doctors would wish to consult? I could never read one-hundredth of the books on the shelves or the journals on the tables; I could never listen to all the lectures or visit all the great men. I could only seek self-education by co-education, by personal discussion, by learning from others what they had read and heard and imparting to them my gleanings. I must join a surgical club. But I found that all existing clubs included surgeons of all degrees of seniority and I knew only too well the great gulf that separates men of different ages and standing, and prohibits that almost wordless transference of mental and spiritual emanations that forms the basis of true friendship and true education. The eminent and the humble, the professor and the pupil, belong to two worlds like Kipling's East and West, and never the twain shall meet. Pride on the one hand, guarded reserve on the other, the Jehovah complex and the inferiority complex, are seldom broken down even by good will or abolished by alcohol, the sure remover of inhibitions.

With a few friends I started a new club, the Surgical Travellers, whose aims were simple. It must be large enough to secure the respect and attention of centres we proposed to visit, but so small that all could see in an operating-theatre, all could hear at a bedside discussion, and all could discuss what they had seen and heard in the evening: the number we chose was 15. The members must represent the widest field of medical schools. And all must be of comparable standing and seniority. This little university, for a university is an association of students for mutual benefit, met in most of the cities of Britain and many of the capitals of Europe between the two wars. It enabled its members to grow up together, to draw strength from each other's enthusiasms, to mitigate each other's failings. To each of us it has been a constant source of spiritual refreshment, and the affection in which we hold it today is an index of what we have learned from it. I say with some pride that of those fifteen who got together long ago, four are now professors of surgery and eight have been consultants to one of His Majesty's Services.

That personal discussion can dispose in a few minutes of difficulties that remain unsolved after months of correspondence is a commonplace. Why else Dumbarton Oaks, Teheran, Yalta, and Bretton Woods? Many of the technical devices which were decisive in

* Presidential address at the first meeting of the Mid Bucks Medical Society, Jan. 18, 1946.

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bringing victory to the Allies—in chemotherapy, in radar, in aeroplane design, in jet-propulsion—came into being because every device of modern transport was used to bring the leading men in their respective spheres into personal contact, and enable them to settle, in a few hours of talk round the table, points of detail that might otherwise have held up the whole project for years.

* * *

There is need then for this society, and it has arisen to fill that need. On its birthday I would venture to offer it some parental advice. It must be broad in its aims, its interests, and its membership. It must avoid every political flavour, and not only medical or party politics but any attempt to secure unanimity by persuasion, or to use numbers to gain an objective. It must never tend to represent one group of doctors or one section of practice, to foster the reputation of a particular hospital, to push the interests of one town or district, to negotiate for financial terms, or to run any kind of sectional racket. At first its aims should not be too clearly defined lest its growth be interfered with and its free blossoming fail on account of the roots being pot-bound. At its meetings, all should be encouraged to take part. The senior practitioner can contribute a wealth of wisdom from his long experience, the youngster can recount what they are saying in the hospitals. Your old men shall dream dreams and your young men shall see visions. It should not meet too often, and at one of the meetings there should be an address by a non-medical speaker—a journalist, a lawyer, a traveller, a manufacturer. Its geographical area should be left vague, and room must be allowed for growth. Limitations will come and procedure will be laid down, but let these come by tradition and not by deliberate planning. If it shapes itself as the natural expression of the desires and needs of the practitioners of Mid Bucks, it will have the native strength of all things that have grown naturally.

" States of native strength possessed,
Though very poor, can still be very blest.
And self-dependent power can time defy,
As rocks resist the billows and the sky."

ONE-SHOT TREATMENT OF ACUTE GONORRHŒA WITH PENICILLIN

REVIEW OF 617 MALE CASES

T. R. LLOYD JONES
M.R.C.S.
SURGEON CAPTAIN R.N.; CONSULTANT IN VENEREAL DISEASES

E. M. DONALDSON
M.B.Edin., D.P.H.

S. J. ALLEN
M.D.Belf.
SURGEON LIEUT.-COMMANDERS R.N.V.R.

THE first accounts of the successful use of penicillin in the treatment of gonorrhœa (Herrell et al. 1943, Mahoney et al. 1943) were followed by numerous reports endorsing their enthusiastic claims. It soon became apparent that doses of 10,000–20,000 units, if dissolved in water or saline and injected at intervals of 3 hours until a total dosage of the order of 100,000 units had been administered, cured most of the uncomplicated cases.

Thereafter attention was increasingly directed to defining optimal time-dose relationships, and Sternberg and Turner (1944) found that 100,000 units given over 12 hours cured 96·6% of 261 male cases, results being no better if the same dose was spread over 27 hours. To make treatment available for outpatients, several "accelerated" schedules in which the time-spread was further reduced were presented in America. A schedule calling for five intramuscular injections of 30,000 units at intervals of 2 hours was evolved in this country (Lloyd Jones et al. 1945) and has since proved satisfactory as the standard treatment for gonorrhœa in the Royal Navy.

The present report is based on laboratory and clinical investigation of 617 cases, and describes an attempt to find the treatment for acute gonorrhœa in the male which most nearly approaches the ideal. Sodium penicillin from commercial American sources was used throughout.

The ideal treatment should fulfil the following criteria:

(1) It should be completed with a single injection.
(2) It should entail no toxic effects, including undesirable local reactions at the site of injection.
(3) It should bring about "early cure" in at least 90% of uncomplicated cases, while avoiding the production of asymptomatic carrier states in an appreciable number of "cured" cases.
(4) It should not be liable to produce penicillin-fastness of the responsible gonococcus or otherwise prejudice subsequent treatment in the event of failure.
(5) It should interfere as little as possible with the diagnosis of syphilis acquired concomitantly with gonorrhœa.
(6) It should be readily available and convenient in use.

As a working hypothesis, it is submitted that clinical results may be related to blood-levels of penicillin attained in patients under treatment. Thus the standard Naval schedule described above produced average serum inhibition levels—determined by the hæmolytic streptococcus technique of Fleming (1944)—of 0·25 unit per ml. or more for 9½ hours or longer in 40 cases; reduction of dose or time-spread led to a fall of serum inhibition below these levels and correspondingly inferior clinical results. However, several reports, notably that of Sternberg and Turner (1944), demonstrated that smaller doses given less frequently and for a much longer time are equally successful in curing over 95% of cases. Thus it appears that most patients will be cured whose blood-penicillin is maintained either at a relatively constant high level for 9 hours, or at a lower fluctuating level for 24 hours.

SINGLE INJECTION OF AQUEOUS SOLUTIONS

Since a single injection in aqueous solution would fulfil most of the criteria listed above, it seemed important to determine the effect of large doses in terms of blood-penicillin levels and clinical results. Cases were treated with single injections of sodium penicillin 500,000–1,000,000 units, serum-penicillin levels being estimated for each dosage used. After an injection of 1,000,000 units a serum level of 0·25 unit or more per ml. was maintained for a maximum of 8½ hours, no penicillin being detected at 13½ hours; smaller doses gave lower levels. Clinical results are detailed later, but it was found that a 90% cure-rate could not be attained with this range of dosage.

SINGLE INJECTION OF PENICILLIN IN VEHICLES

Suspensions of penicillin in pectin, ol. arachis *B.P.* (peanut oil), and ol. arachis with 5% 'Lanette Wax' were prepared. Some delay in absorption after injection was demonstrated for all three vehicles; but serum-penicillin levels of 0·25 unit per ml. were not maintained for 8 hours, and clinical results in a few cases were poor.

Suspensions containing 500,000 units of penicillin and 60% adeps lanæ (by weight) in 1 and 2 c.cm. of ol. arachis proved more satisfactory in respect of delay in absorption (fig. 1), but their high viscosity rendered them unsuitable for routine use. The graphs in fig. 1 are not intended to provide accurate quantitative data but to demonstrate the general trend of serum-penicillin levels in several cases as determined by the capillary-tube technique of Fleming (1944), using hæmolytic streptococcus (Milne) as the test organism.

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MAGNESIUM SULPHATE FOR DELAYING ABSORPTION

In preparing the suspensions described above, the hygroscopic properties of sodium penicillin were a constant source of difficulty in manipulating the powder after it had been removed from the ampoule (calcium penicillin was not obtainable at this time). The effect of mixing the penicillin powder with another hygroscopic substance in the hope that the latter would compete with it for the available tissue fluids after injection, thus retarding its solution and subsequent absorption, appeared worthy of investigation.

With this end in view experiments were made with sodium phosphate and several varieties of magnesium sulphate. Magnesium sulphate was selected for further study as being readily obtainable, non-toxic in the dosage to be used, and possessing in high degree the hygroscopic properties desired; ol. arachis, having proved satisfactory in other suspensions, was retained as the vehicle.

In the absence of exact knowledge regarding the mode of action, selection of the amount of magnesium sulphate to be incorporated in the suspension was necessarily somewhat arbitrary. Having decided that 200,000–300,000 units of penicillin in a volume of 1 c.cm. should constitute the "standard dose," we found that 5 g. of magnesium sulphate monohydrate was the maximal amount which, mixed with 3,000,000 units of sodium penicillin and suspended in 10 c.cm. of ol. arachis, made a preparation which could be drawn into a syringe. Subsequently the amount of magnesium sulphate was reduced, thus forming a preparation which was fluid at room temperature and could be injected without difficulty through a 19 B.S.W.G. needle.

Preparation of Magnesium-sulphate Suspensions.—It is essential that all materials and utensils should be sterile and free from moisture. We have found it advantageous to carry out the manipulations as rapidly as possible in a warm dry room free from draughts.

Materials.—(1) Magnesium sulphate monohydrate ($MgSo_4.H_2O$) (B.D.H.). This salt is preferred to magnesium sulphate exsiccatus *B.P.* because of its known chemical purity. (2) Penicillin sodium (as dry powder, supplied by various firms). (3) Ol. arachis *B.P.*

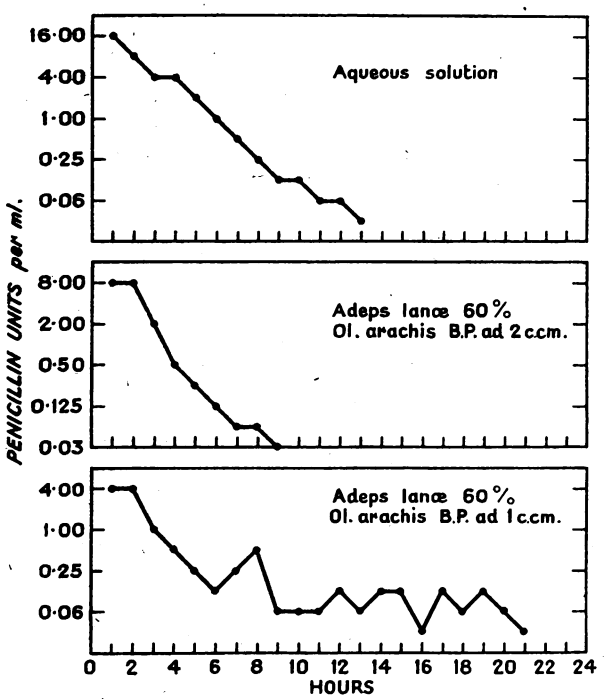

Fig. 1—Trends of blood-levels obtained with a single intramuscular injection of 500,000 units of penicillin in various media.

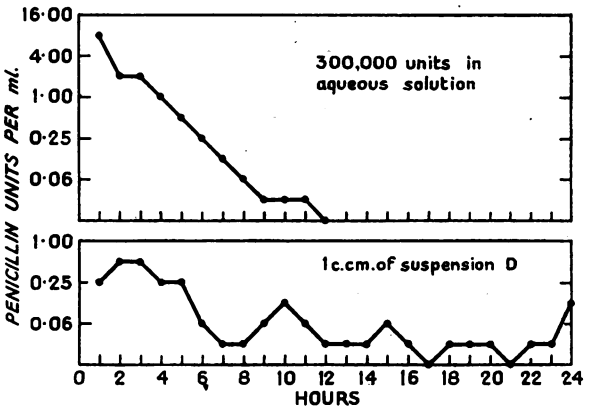

Fig. 2—Blood-levels obtained with a single subcutaneous injection of 300,000 units of penicillin in aqueous solution (average of 12 cases), and of 250,000 units contained in 1 c.cm. of suspension D (average of 20 cases).

Procedure.—The magnesium sulphate is weighed on filter paper and poured into a clean sterile mortar. Penicillin is then added direct from the ampoule and thoroughly mixed with the magnesium sulphate by grinding with a sterile pestle. Finally 10 c.cm. of sterile ol. arachis is added gradually, and the grinding continued until uniform thin consistence and colour are attained; this takes about 15 min. The contents of the mortar are then drawn into a sterile dry 20 c.cm. syringe, a dry needle is attached, and the contents are expelled into a dry sterile bottle through a rubber cap.

TABLE I—FORMULÆ OF SUSPENSIONS

Suspension	Mag. sulph. (g.)	Sodium penicillin (mega units)	Ol. arachis (c.cm.)
A	4·5	3·0	10
B	4·5	2·0	10
C	5·0	3·0	10
D	2·25	3·0	10

Storage.—The preparations were stored at room temperature, and tests carried out on several samples showed no significant loss of potency up to two months.

Table I shows the formulæ for the four suspensions prepared. Since both powders are insoluble in oil, the final volume must exceed 10 c.cm. In practice we have found that the volume varies with each batch prepared, never falling below 12 c.cm. Thus the "standard dose" of suspensions A, C, and D for injection (1 c.cm.) contains a maximum of 250,000 units. Further, for technical reasons, only one "batch" was prepared at a time; samples of a given suspension prepared on different days varied, therefore, in homogeneity and amount of penicillin per c.cm. Our primary concern was the determination of the extent of delay in absorption of penicillin from the suspensions, so no attempt was made to standardise accurately their penicillin content.

Fig. 2 shows the order of delay in absorption following the subcutaneous injection of 1 c.cm. of suspension D, containing approximately 250,000 units. The graph is composite, being based on readings from 20 cases, and is designed to show only the general trend of serum-penicillin levels. The serum of 8 out of 11 patients examined 24 hours after injection gave demonstrable penicillin levels, as determined by the capillary-tube technique of Fleming (1944), using *Staph. aureus* (Oxford) as the test organism. These levels were 0·0625, 0·03, 0·0625, 0·0625, 0·25, 0·25, 0·25, and 0·0625 unit per c.cm.

CLINICAL DETAILS AND MANAGEMENT

Material.—During the investigation every patient with gonorrhœa referred to the clinic was treated by one of the single-injection methods described. Most of the patients

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were otherwise healthy young naval ratings with uncomplicated gonorrhœa; many had been treated unsuccessfully elsewhere with sulphonamides or penicillin; cases of prostatitis, epididymitis, tysonitis, and littritis are included. Except a few complicated cases requiring bed rest and those admitted for laboratory investigations, patients returned to full duty after diagnosis and treatment.

Diagnosis.—Gonococci were demonstrated in gram-stained smears of material obtained from every case before treatment was instituted. The anatomical extent of the disease was determined and a thorough search made for surface lesions of syphilis. The patient was informed of the diagnosis and its social implications, instructed to keep his genitalia clean, and advised to forgo alcohol during the seven days following treatment.

Treatment.—After a sample of blood had been withdrawn for the Wassermann reaction, each patient received a single injection of the preparation under investigation; no other treatment was prescribed, and he returned to full duty with instructions to report for examination at the end of a week.

When giving magnesium sulphate suspensions, it is essential to use sterile and perfectly dry needles and syringes. In the presence of moisture, crystals of magnesium sulphate are liable to separate from the suspensions, with consequent blockage of the needle. The dose required (usually 1 c.cm.) is aspirated from the rubber-capped bottle after the contained suspension has been rendered as uniform as possible by vigorous shaking. Warming of the preparations or syringes is unnecessary. Injections are made into the muscle underlying the upper and outer quadrant of the buttock, or into the subcutaneous tissue in the same area, according as intramuscular or subcutaneous administration is desired. Ether was found satisfactory for sterilising the skin.

Toxic Effects.—No systemic upsets were noted with any of the preparations described, but local reactions developed at the site of injection in about half the patients treated with magnesium sulphate suspensions. These took the form of palpable nodules persisting for 1–4 weeks; in 10 cases tenderness to palpation was present, but this passed off within a fortnight. The complete absence of pain at the time of injection was a striking feature, and the minor reactions noted above did not cause any disability, being less troublesome in this respect than the initial injection of many insoluble bismuth preparations.

Surveillance.—The cases were kept under observation for three months, prostatic secretions being examined by culture and/or smear 1, 2, 4, 8, and 12 weeks after treatment. No case was pronounced cured unless a negative culture was obtained at the twelfth week. Blood was tested for the Wassermann reaction monthly for three months, and a final test, six months after treatment, was advised. Syphilitic lesions were looked for at each visit.

Service conditions precluded the completion of surveillance in every case; and, to facilitate comparison of results in the various series treated, we assessed each case regarding "cure" on the basis of the result of the examination made a week after treatment. Thus all cases included in this report have had a *minimum* of seven days' surveillance, most of them considerably longer.

Individual response to treatment differed in no essential from that noted with the standard Naval schedule (Lloyd Jones et al. 1945). As a rule gonococci disappeared from smears of the urethral exudate within 4–5 hours, by which time discharges, originally purulent, had become less profuse and mucopurulent or mucoid; in some 10% of cases the residual urethritis following elimination of the gonococcus persisted for a week, less commonly for 2–3 weeks. This condition responded to an increased fluid intake with a simple alkaline diuretic; it rarely required gentle irrigation with a mild antiseptic lotion for a few days. Our observations on the response of the comparatively few complicated cases treated are in accord with general experience with multiple-injection methods and need not be detailed here.

Masking of Syphilis.—There were 10 cases of syphilis in which primary sores appeared within normal incubation periods after penicillin treatment for gonorrhœa (Lloyd Jones et al. 1946). One of these had received a single aqueous injection of 800,000 units; another had received 300,000 units in a magnesium sulphate suspension; both are included in the present series. No other cases of syphilis have been diagnosed after the single injections here described. These observations may perhaps lend support to the suggestion of Romansky et al. (1945) that a single large injection of penicillin, given at the time gonorrhœa appears, may prevent the development of concomitantly acquired syphilis.

Failures.—No case of non-response in the strict sense of the term was observed, all cases examined showing negative smears after treatment. Relapse, in which gonococci were demonstrable in smears or cultures after their initial disappearance, occurred almost invariably within 7 days after treatment, most commonly between the 3rd and 5th days. Such a relapse does not necessarily imply failure on the part of the drug, but no attempt is made in discussing the results to distinguish relapse, thus defined, from recrudescence of infection in a closed or poorly draining focus with subsequent reinfection of the urethra. Metastatic complications after treatment were not observed in this series.

No figures can be given for the overall incidence of "late relapse" or asymptomatic carrier states, but of 371 cases under surveillance for over four weeks, 1 showed "late relapse" and none gave positive smears or cultures in the absence of clinical signs.

TABLE II—RESULTS OF TREATMENT

Group	Dose of penicillin (units)	Vehicle	Volume of injection (c.cm.)	Mode of injection	No. of cases treated	No. of failures
1	500,000 to 1,000,000	Sterile water	3·5	IM	113	13 (*11·4%*)
2	300,000	Adeps lanæ 20–70 % in ol. arachis	1	IM	29	10 (*34·4%*)
3	500,000	Adeps lanæ 60 % in ol. arachis	1 2	IM IM	22 23 } 45	0 2 } 2 (*4·4%*)
4	300,000	Susp. A	1	SC	34	4 (*11·7%*)
5	200,000	Susp. B	1	SC	91	10 (*10·9%*)
6	100,000	Susp. B	0·5	SC	31	11 (*35·5%*)
7	300,000	Susp. C	1	SC IM	104 6 } 110	7 (*6·7%*) 1 (*16·6%*) } 8 (*7·3%*)
8	300,000	Susp. D	1·	SC IM	113 51 } 164	5 (*4·4%*) 17 (*33·3%*) } 22 (*13·3%*)
		Total			617	80 (*12·9%*)

Surveillance: all cases, 1 week; 371 (60 %), over 4 weeks.
IM = intramuscular. SC = subcutaneous. Susp. = suspension

TABLE III—EFFECT OF ROUTE OF ADMINISTRATION ON RESULTS: PENICILLIN 300,000 UNITS IN MAGNESIUM SULPHATE SUSPENSIONS

Mode of injection	Vehicle	No. of cases	Relapses
Subcutaneous	Suspension A	34	4 (*11·7%*)
	Suspension C	104	7 (*6·7%*)
	Suspension D	113	5 (*4·42%*)
	Total ..	251	16 (*6·37%*)
Intramuscular	Suspension C	6	1 (*16·6%*)
	Suspension D	51	17 (*33·3%*)
	Total ..	57	18 (*31·6%*)

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RESULTS OF TREATMENT

The results are summarised in tables II and III. It is to be emphasised that the dose of penicillin shown for suspensions A, B, C, and D is considerably higher than the amount actually injected. The inevitable variations in dosage were pointed out in discussing table I, and it will be recalled that the maximal dose in the case of suspensions A, C, and D is actually 250,000 units.

The following conclusions are possible:

(1) A dose of 500,000 units of penicillin in adeps lanæ is more effective than an equal or larger dose in simple aqueous solution (groups 1 and 3). In group 3 there is a suggestion, but no more, that the volume of the injection may influence the results.

(2) Approximately 250,000 units of penicillin, if suspended in magnesium sulphate and ol. arachis, is more effective than double that dose in aqueous solution (groups 1, 7, and 8).

(3) Subcutaneous injection of a given magnesium sulphate preparation gives better clinical results than does the same dose injected intramuscularly (groups 7 and 8). This is clearly shown in table III.

Response of Failures to Further Treatment.—Eighty cases were regarded as failures and received a second injection of the preparation used in the first instance; 71 showed a prompt response and remained clinically and bacteriologically negative for periods up to three months. The remaining 9 cases were apparently cured by a third single injection; 5 of these had demonstrable foci of infection in the prostate, vesicles, or urethra, for which appropriate local treatment was also prescribed.

Results with Magnesium Sulphate Suspensions.—Groups 4–8 constitute a series of 430 consecutive cases treated in four months, 376 as outpatients; 280 have completed over four weeks' surveillance; the remainder are still under observation. The results obtained are remarkably uniform when the variations between different batches of a given suspension are recalled. These are due to the relatively crude methods of dispensing used, and may explain the poor results with suspension A, the first to be prepared. The minimal amount of magnesium sulphate necessary to produce consistent clinical results has not yet been determined, but it appears unnecessary to exceed 2·25 g. per 10 c.cm. (suspension D).

Attention is drawn to the excellent results following the subcutaneous injection of 1 c.cm. of suspensions C and D, only 12 failures occurring in 217 cases treated. Suspension D is preferred because of its lower viscosity.

DISCUSSION

Of vehicles in current use for delaying absorption of penicillin that most fully investigated is the peanut oil and beeswax mixture of Romansky and Rittman (1944). The originators emphasise that calcium penicillin, which is not yet obtainable in this country, is essential for the preparation of satisfactory mixtures. They have demonstrated penicillin in the blood for an average period of ten hours in 60 patients after an injection of 150,000 units (Romansky et al. 1945). Such mixtures have a high viscosity and must be heated before they can be drawn into a warm syringe; in their present form they cannot be considered suitable for general use.

The magnesium sulphate suspensions described have none of these disadvantages. It is premature to compare their ability to delay the absorption of penicillin with that of peanut oil and beeswax mixtures, but our results appear sufficiently encouraging to merit further investigation of the principle involved. Much further work is necessary (1) to confirm or refute these findings; and (2) to ascertain the proportions of the several ingredients necessary to obtain the best results. The exact mode of action remains to be defined; this requires more facilities than were available to us.

Attention is drawn to the advantage of subcutaneous over intramuscular injection when slow absorption is desired. The slower rate of absorption following subcutaneous injection, long recognised for aqueous solutions, is apparently much accentuated by the use of such vehicles as we describe.

The findings reported, if confirmed and extended, will have applications far beyond the treatment of gonorrhœa. The maintenance of a bacteriostatic level of penicillin in the blood-stream for twenty-four hours after a single injection will lessen the burden of protracted systemic penicillin therapy for patient and medical staff alike.

For the reasons stated we have confined our investigations to single-injection methods. The more efficient of these have given remarkably good early results, and at the time of writing the subcutaneous injection of 1 c.cm. of suspension D, containing approximately 250,000 units of sodium penicillin, constitutes our routine treatment for gonorrhœa. This treatment has now "cured" 108 of 113 patients treated; it fulfils in large measure the criteria laid down for the ideal treatment of gonorrhœa and may be compared with the single-injection methods of Romansky et al. (1945). Our results have been obtained in outpatients pursuing their normal activities—in contrast to the hospital patients reported by Romansky. Sodium penicillin was used throughout, and consistent results were obtained in spite of the crude methods of dispensing employed.

We believe that more extended clinical trials are now justified, and that these should be carried out with a mechanically prepared suspension standardised to contain 300,000 units per c.cm.; this would allow direct comparison of the results obtained by different clinicians.

Through the courtesy of Dr. Robert Forgan we have carried out preliminary trials with a suspension prepared in the laboratories of Pharmaceutical Specialities (May & Baker) Ltd. The results obtained to date are encouraging, and the preparation has the advantage of being more homogeneous and free-flowing at room temperature than our own suspensions.

It may be that the use of calcium penicillin will offer added advantages in preparation and ease of administration. The packing of individual doses in ampoules such as the 'Tubunic' now in use for morphine is contemplated and would make treatment readily available to a wider circle of patients.

SUMMARY

A new vehicle for prolonging the action of penicillin, consisting of magnesium sulphate monohydrate in peanut oil, is described. Penicillin has been demonstrated in the sera of 8 out of 11 patients twenty-four hours after a single subcutaneous injection of 250,000 units in this vehicle.

Short-term results in 617 cases of gonorrhœa treated by various single-injection methods are given; 87% were "cured" with one injection. The method now in routine use has "cured" 108 of 113 (95·6%) outpatients treated.

The advantage of subcutaneous over intramuscular injection for delaying absorption is emphasised.

Our thanks are due to Sir Sheldon Dudley, late Medical Director-General of the Navy, for his encouragement throughout the work and for permission to publish this paper; to Sir Alexander Fleming for his kindly interest; to Sick Berth Chief Petty Officer T. Jones and Sick Berth Petty Officer S. K. Hunter for estimations of serum-penicillin levels; to S.B.C.P.O. L. Rickard, who first suggested their use, for dispensing the magnesium-sulphate suspensions; to S.B.C.P.O. J. Nuttall and S.B.P.O. J. Bastable for help in the laboratory; and the sick berth staff for their loyal and cheerful coöperation.

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AIR-EMBOLISM AND PNEUMOMEDIASTINUM IN ARTIFICIAL PNEUMOPERITONEUM

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THE inflation of body cavities with air is now widely practised, and the chest physician has recently applied pneumoperitoneum on a more extensive scale than in past years, when the method was occasionally tried in the hope of relieving tuberculous enteritis (Rilance and Warring 1941, 1944, Clifford-Jones and Macdonald 1943). Sufficient experience is now being obtained to make some assessment of its value in the treatment of pulmonary tuberculosis possible in the near future; it is also adequate to have provided a fair sample of the complications likely to be met. Aslett and Jarman (1945) record 2 deaths in treating 42 patients; but a large proportion of these had advanced disease.

Since 1942 more than 450 operations for the induction of pneumoperitoneum (P.P.) have been performed at Clare Hall County Hospital, and more than 12,500 refills have been given. The incidence of important complications is very low, but many points of interest arise in considering what may happen when air is introduced into the peritoneal cavity. The potentially dangerous complications are puncture of the viscera (especially the alimentary canal), effusion into the peritoneum, air-embolism, and mediastinal emphysema.

Puncture of viscera, to the novice, may seem the worst complication, but with care in technique the accident is surprisingly rare. Several cases have been recognised (in one of which fæcal organisms were cultivated from the needle), but there were no untoward consequences. It is probable that viscera are wounded more often than is recognised. It is indeed likely that greater risks occur from not advancing the needle far enough, injecting air outside the peritoneum, and so possibly originating air-embolism.

Effusion in the peritoneal cavity is also not common. It has been observed 8 times in our series; but clearly the diagnosis of a small amount of peritoneal fluid is difficult, and such may have been missed. When effusion does develop, the suspicion arises that there was already some tuberculous lesion involving the peritoneum. The introduction of air probably impairs localisation of the focus by adhesions and therefore may help to spread infection. For this reason it is unwise to use P.P. in the presence of known tuberculous abdominal disease. In treating tuberculous enteritis in the advanced case this risk is accepted, but peritoneal effusion and intestinal perforation are then not uncommon, though the symptoms in cachectic patients are often vague, and even a purulent peritonitis may be overlooked. Two of the effusions experienced were in this category.

No patients have developed acute appendicitis, or other abdominal emergency, though a few have shown previously unrecognised herniæ.

Air-embolism, a more dangerous possibility, is described below, with illustrative cases.

AIR-EMBOLISM

CASE 1.—A woman, aged 37, had had the right phrenic nerve crushed, and nine refills of P.P. After an unsuccessful attempt at a refill, a second trial was made later in the day, just below the right costal margin. Pressure +5 cm.; no swing. Air introduction proceeded very slowly, and after 150 c.cm. the patient became restless and cyanotic. The pupils were widely dilated, and rapidly increasing dyspnœa set in, with stertor and loss of consciousness, death occurring after a minute or so. At necropsy there was evidence of trauma of the liver, with subcapsular air-bubbles; in the heart there was frothy blood in the right auricle and ventricle. The cause of death therefore appeared to be air introduced through the liver, so reaching the right side of the heart, obstructing the circulation. This is the only fatality in the series of 450 patients.

CASE 2.—A man, aged 20, had extensive bilateral pulmonary tuberculosis, and P.P. was tried as a measure of desperation. During induction the patient complained of faintness, shortness of breath, and loss of power in the right arm. He became pale, with pulse of poor volume, and the pupils were dilated. The right arm showed complete loss of motor power but no sensory loss; the tendon-jerks in the right arm and leg were exaggerated. The function of the arm recovered after half an hour, but during the rest of the day he had dyspnœa and cough. There was some cyanosis and considerable frothy sputum, with widespread moist râles in the lungs for some days. He recovered from this attack but died six weeks later of extensive pulmonary tuberculosis of hæmatogenous type, with emphysema, and pneumonia of the left lower lobe. At necropsy the heart was large (weight 11 oz.). Both the right and the left chambers appeared dilated, and the muscle pale. The site of the foramen ovale was imperfectly closed by a thin membrane through which was a small channel or valve-like slit, 3 mm. broad.

CASE 3.—A man, aged 25, at attempted induction of pneumoperitoneum, developed cerebral air-embolism. He complained of tingling on the right side of the face, but found that he could not move the right arm; he became unconscious and collapsed but not cyanotic, and the breathing was not stertorous. Full recovery followed after an hour, without sequelæ.

Case 2 had not only pulmonary embolism but also definite signs of cerebral embolism. This interesting combination suggests some crossing of the stream of blood in the heart. At necropsy the finding of a patent foramen ovale indicated a possible route for the embolic air which caused a temporary lesion of the left cerebral cortex.

Some patency of the foramen ovale of this degree is more common than is usually recognised: "clinically unimportant patency of the foramen ovale has been reported in nearly one-quarter of all autopsied cases" (White 1944). Though the blood-stream in a normal functioning heart with this defect may pass successfully from the right auricle to right ventricle, the presence of bloody froth in the chambers and an impaired pulmonary circulation due to pulmonary embolism may increase the probability of the passage of air through the opening. In this patient there was evidence of pulmonary embolism in the sudden onset of signs of œdema of the lungs and of a "crossed" air-embolism affecting the motor area of the cerebral cortex. But this explanation appears a little forced, and an alternative route for the passage of air from the site of puncture to the brain must be postulated and is indeed demanded by the signs shown by case 3, who experienced an attack closely resembling that of a typical cerebral air-embolism, such as occurs occasionally with artificial pneumothorax. Here the usual explanation has been that air enters a pulmonary vein and reaches the arterial system of the brain, most commonly the middle cerebral artery. But this theory has unsatisfactory aspects. There is usually no clear sign of air in the chambers of the heart (though coronary embolism has been proved in one case), and there is often a delay of some minutes before the attack begins—longer than the rapid transit of blood in the arterial circulation from the lung to the brain; moreover this theory does not explain cerebral air-embolism arising in the veins of the abdominal wall or of the abdominal viscera.

To evade the difficulties of the usual explanation of air-embolism in pneumothorax, Bohorfoush (1943) has suggested that in this accident air enters the veins of the chest wall, not the pulmonary circulation, and finally reaches the longitudinal sinus, obstructing the veins draining the affected cortical areas. Air-bubbles can pass, he thinks, from the intercostal vein into the superior vena cava, and, if the patient is in an erect (or partly erect) position, float upwards against the stream

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of the internal jugular vein to the cerebral sinuses. Possibly also air may pass into the plexus of veins inside the vertebral canal, and so reach the sinuses. Batson (1940) has shown that a free anastomosis exists between the veins of the pelvis and this vertebral plexus. His beautiful demonstration of this vertebral "storage lake" explains many clinical facts of embolism and metastasis, since not only the pelvic and abdominal veins but also the segmental (intercostal) and azygos vessels and the bronchial vein have definite connexions with this important fourth venous system. Purdon-Martin (1941) has described attacks of sagittal sinus thrombosis with convulsions and paresis developing after childbirth, for which he proposes, as the only reasonable explanation, the migration of fragments of clot from the pelvic veins by this route. The vertebral venous plexus tends to receive a greater volume of blood when the caval circulation is subject to pressure or obstruction, as during cough or vomiting and probably with pneumoperitoneum. In fact, during cough or vomiting it may be that the caval circulation is temporarily completely obstructed.

Air-embolism may therefore reach the cerebral circulation from the body by several routes:—

(1) By pulmonary veins through the left heart to the cerebral arteries.
(2) Through a tributary of a vena cava, across a perforate cardiac septum, into the arterial circulation.
(3) By veins draining into the azygos system or the superior vena cava and thence by the jugular vein to the cerebral sinuses.
(4) From abdominal or thoracic segmental veins into the anastomosis with the vertebral plexus of veins, and so again to the intracranial sinuses, where smaller veins which drain into these are obstructed and possibly thrombose in fatal or persistent cases.

In case 2 the attacks could be adequately explained by the third route; air having reached the superior vena cava may have entered the right side of the heart and the pulmonary circulation, while some bubbles proceeded also up the jugular vein to the cerebral sinuses. If the air by-passes the heart into the innominate or jugular veins, only cerebral air-embolism results, as in case 3. The variety in the types of attack of cerebral air-embolism shows that each of these routes may be taken, though the "crossed embolism" is a doubtful entity.

MEDIASTINAL EMPHYSEMA

In several other patients attacks have occurred which do not fall into the group just described, though the more severe attacks, by their urgency and the nature of their symptoms, somewhat resemble cerebral air-embolism. It has been suggested (*Lancet* 1945) that mediastinal emphysema may be a factor in complications of this kind. Macklin and Macklin (1944) have given an excellent description of interstitial emphysema of the lungs and mediastinum, both of clinical and experimental origin. In this condition air insinuates itself into the stroma of the lung from the alveoli, and, pushing onwards to the lung roots, compresses the veins and capillaries, in the most severe cases causing extreme cyanosis and stertorous dyspnœa, with death from asphyxia. Not only are the vessels compressed but the air in the lung stroma has a splinting effect and prevents normal lung retraction and so hinders respiration. The mediastinal emphysema so produced may in lesser degree produce less severe attacks of cyanosis and dyspnœa. Air may spread, producing a wide variety of symptoms and lesions, including dysphagia, subcutaneous emphysema of the neck (a valuable "safety valve" which relieves the condition), pneumothorax, and retroperitoneal collections of air, possibly entering the peritoneum (Jones 1945). The number of pathological lesions which may initiate this process is great. Graham et al. (1935) also give a full account of spontaneous mediastinal emphysema, incidentally quoting that "Jehn and Nissen have stated that mediastinal emphysema was once reported after a pneumoperitoneum."

In artificially induced pneumoperitoneum, the complication of mediastinal emphysema may arise and would then develop in reverse order: air from the pneumoperitoneum would pass through a hiatus of the diaphragm beside the œsophagus or the aorta and cause the above-named conditions, including even perhaps interstitial emphysema of the lungs.

The following cases may be due to emphysema of the mediastinum and associated disturbances:

CASE 4.—A woman, aged 25, had had P.P. maintained for five months. During this time the patient had four attacks, which occurred at periods varying from eight hours to five days after refill. The earlier attacks were interpreted as having an hysterical basis. In the last attack, which appears to be like the others, the patient experienced some difficulty in expiration and noticed a wheezing in the chest. Generalised pins-and-needles developed, and she became confused. Cyanosis was present and increased and was relieved by oxygen. There was no cry or convulsive movement. The attacks lasted about 10 minutes, but next day there was tenderness in the neck but no feeling of "crackling."

CASE 5.—A boy, aged 15 (case reported by Clifford-Jones and Macdonald in 1943), had tightness in the chest and pain on both sides after a refill, with slight difficulty in swallowing. There was resonance to percussion over the præcordium, and a superficial crepitant murmur, synchronous with the heart-beat. Next day there was also palpable crepitus in the suprasternal notch, but after a few days all these signs cleared.

CASE 6.—A woman, aged 35, had had P.P. for two years, with right phrenic crush. Refills were given below the right costal margin; at the last refill, three attempts were needed before air was allowed to flow. As the refill was proceeding, the patient felt "as if air was creeping to the left shoulder," and she had diaphragmatic pain "like she felt at the induction." She said nothing about this at the time but went home; six hours later she felt poorly, both sides of the neck were sore, and swallowing was painful. This trouble cleared in two days. There were no fits or fainting, and no subcutaneous emphysema of the chest wall.

CASE 7.—A woman, aged 29, had had P.P. maintained for eight months (pressure +10 cm.), when radiography revealed an unsuspected shallow pneumothorax on the right side. A few days later, sudden pain arose on the right side and was accompanied by increasing and severe dyspnœa; 1500 c.cm. of air was removed from the pleural cavity, and later an intercostal needle was left in situ for six hours. The patient was then comfortable and volunteered the information that the usual abdominal distension from the P.P. was rapidly reduced at the time of the spontaneous pneumothorax. The abdominal wall appeared flat, and no physical signs of P.P. were present. Radiographic screening next day showed only a very small amount of air under the left diaphragm.

The varying symptoms and signs illustrate how diverse are the manifestations of mediastinal emphysema. In case 5 the air obviously was collected more anteriorly than in the other patients. These accounts indicate that it may reach the mediastinum at the time of refill if it is introduced outside the peritoneal cavity, or may migrate from the peritoneum after a period of days; yet in these patients the amount of air entering the mediastinum seems either to have been relatively small or to have found an outlet.

In pneumomediastinum due to any cause, if the air can escape, serious symptoms may not be experienced or may be rapidly relieved. Subcutaneous emphysema in the neck is often one such mode of relief, as Macklin and Macklin (1944) emphasise.

In case 7 there was a spontaneous pneumothorax, which Macklin and Macklin have also demonstrated as a possible result of experimental interstitial emphysema of the lung. It is noteworthy that in this patient the first attack was slight and unsuspected; in fact only the loss of air from the peritoneal cavity proved the nature of the complication. Banyai and Jurgens (1940) have recorded a similar happening after a refill of P.P. given at a site three finger-breadths below and to the

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left of the umbilicus; in their patient also a large collection of peritoneal air had apparently rapidly migrated to the pleural cavity. Smith (1943) reports bilateral pneumothorax as a fatal complication of P.P. induced for diagnosis; but he believed this to be due to a number of small holes, discovered in the diaphragm, connecting the peritoneum with both pleural cavities. In 4 of our patients Laird (1945) has seen, through a thoracoscope, bubbles on the pleural surface of the diaphragm in patients who had artificial pneumothorax as well as P.P.

AMBIGUOUS CASES

The remaining cases show features which may indicate air-embolism of the brain or mediastinal emphysema or both.

CASE 8.—A woman, aged 35, had P.P. established for a year and disease quiescent. She developed subcutaneous emphysema of the neck three days after a refill. A few weeks later, at another refill, she had slight pain in the left side of the neck, but 900 c.cm. of air was given at a final pressure of +12 cm., and she left the table saying she felt well. While dressing she felt dizzy and collapsed. Her face became cyanosed, breathing was stertorous, the pupils dilated, and the pulse faded and became almost imperceptible. After a few minutes the colour improved, but she became restless, throwing her arms and left leg about, though the right leg was not moved. After half an hour consciousness returned, and complete recovery ensued. She was discharged from the hospital next day.

CASE 9.—A girl, aged 20, whose refills had proved difficult, had at one session considerable subcutaneous emphysema of the abdominal and chest walls near the lower ribs. Four days later she was moved for screening. A "fit" developed, in which the head was thrown back, with tonic and clonic contractions of the limbs. Breathing became stertorous, but there was no cyanosis; the pulse became weaker and almost disappeared; loss of consciousness followed, but after a minute or so consciousness was restored, the pulse improved, and recovery ensued. No paresis was present, and no residual signs of the attack persisted.

Case 8 had an attack which has many resemblances to cerebral air-embolism, and it is reasonable to think that the convulsive fit was at least in part due to such an accident. But the previous development of subcutaneous emphysema of the neck (and not of the chest wall) after a previous refill, and of pain at the same site again, indicates that air then migrated via the mediastinum. In case 9 the onset of the attack four days after air injection seems strong evidence against the entry of air into a vein and consequent air-embolism, yet here the convulsive attack strongly suggests it.

These distinctions make it necessary to consider the alternative explanation that the events in these two patients may have a mixed ætiology. The characteristic signs of mediastinal emphysema in severe cases are stertor and cyanosis and progressive weakness of the pulse; but less severe attacks occur, as has been shown. It seems typical of venous embolism that it arises at the time of operation; and, if the attack in case 9 was in part due to embolism, then air must have migrated from the peritoneal space into tissues like the mediastinum or retroperitoneal tissue, where rupture of a vessel and aspiration of air into that vessel became possible. The same problem arises in the similar case described as air-embolism by Warring and Thomas (1940). Four days after refill the patient was nauseated, vomited thrice in six hours, and, after a brief convulsion with stertorous breathing, died in a few minutes. Similar events occurred in Aslett and Jarman's (1945) cases, where the fatal attacks started two days and one day after the last air injection; but their description is compatible with cardiac failure due to mediastinal emphysema alone, without any cerebral complication.

DIAGNOSIS

Air introduced into the peritoneal cavity, or perchance into the abdominal wall, may therefore wander in an almost bewildering fashion. If air-embolism develops, the symptoms may vary according to the territory of the brain which is involved, and this may depend on the route taken by the aberrant air. The occurrence of cerebral air-embolism in pneumoperitoneum probably needs a purely venous route and therefore provides new light on this complication in pneumothorax. Symptoms usually include paræsthesia, localised convulsions or paresis, loss of vision, and unconsciousness. The pulse is rapid and weak, and the skin pale and cold. These circulatory difficulties are probably of central origin, though coronary air-embolism has been recognised (Alexander 1937). Mediastinal emphysema causes primarily circulatory difficulty, with dyspnœa and cyanosis. The convulsions in cases 8 and 9 may indicate that cerebral air-embolism was also present, especially as in one there was difficulty in introducing air. It is difficult to conceive how air-embolism could arise directly from a collection of peritoneal air several days after refill.

Further observation and experiment are required to elucidate these problems, for the exact diagnosis of the attacks present difficulties both in the fleeting nature of the symptoms, when the attacks are short, and in the need for attending to the acute emergency rather than making an elaborate examination. The amount of air which will cause death may be quite small; it is the site of the embolism which is important.

TREATMENT

The treatment of air-embolism is largely preventive. It is well not to operate on unduly anxious patients, for a smooth induction is less likely; the avoidance of hurry is essential, but technique must be firm and precise and avoid fumbling with the needle in the body wall. In pneumothorax, it is always advisable not to introduce air until it is clear that the needle point is in an air space and not in the lung or chest wall, and a free manometer swing is present. Sterile saline solution may be introduced first to ascertain that the needle is in the pleura. Except for this last useful but not infallible device, the induction of pneumoperitoneum is less easy since there is no negative pressure reading as a guide, and reliance has to be placed on the feeling of penetration of the peritoneum. P.P. should not be attempted if there is a history of previous disease causing adhesions, just as care must be redoubled with pleural adhesions.

If air-embolism is produced, the head is lowered, and the collapse treated with warmth and stimulants. Mediastinal emphysema calls for relief of the cardiac embarrassment. Any air present should be removed from the peritoneum; oxygen should be given to relieve cyanosis, and sedatives to relieve anxiety and distress and to prevent unnecessary movement. If natural relief by subcutaneous emphysema does not take place, incision of the skin and introduction of a cannula above the manubrium with aspiration of air by a pneumothorax apparatus may be attempted. When pneumothorax is present, this should also be relieved, and if cyanosis is extreme venesection may be required (Graham et al. 1935).

COMMENT

These complications have been discussed in some detail because of their intrinsic interest; their frequency is not sufficient to cause restriction of the use of P.P. These difficulties have been encountered in only 9 patients in well over 13,000 attempted injections of air into the peritoneal cavity, with 1 fatality. When one remembers that the incidence of air-embolism in pneumothorax therapy is of the same order, and that P.P. does not provide any risk compared with those which arise from effusion and empyema, it is fair to say that artificial pneumoperitoneum is a relatively safe proceeding.

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SUMMARY

Therapeutic pneumoperitoneum may be accompanied by various minor and major complications.

The most dangerous complications are air-embolism and mediastinal emphysema.

These are rare and occurred in 9 patients, with 1 fatality, in over 13,000 air injections.

The mechanism of air-embolism of the brain due to injection of air at pneumoperitoneum refills is discussed.

The signs associated with acute mediastinal emphysema in P.P. resemble those due to the other causes of the condition.

I acknowledge with thanks the help of my medical colleagues at Clare Hall County Hospital.

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PULMONARY ŒDEMA IN CHEST WOUNDS

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THE most serious complication of large lacerating wounds of the lung and the usual cause of death after operation in such cases, is in our experience pulmonary œdema. Treatment has been most unsatisfactory. The signs of pulmonary œdema have steadily progressed, the patient becoming more and more anoxic. This is the lethal lesion, for the circulation remains satisfactory for a surprisingly long period after the onset of pulmonary œdema. The effect, then, is purely the mechanical one of obstruction to the flow of air through the bronchi and bronchioles and into the alveoli. Attempts to increase the oxygen intake have been made and large doses of atropine sulphate given intravenously. That atropine sulphate reduces the secretion of mucus in these cases is certainly true, and that it is thereby beneficial is probable; but it cannot affect pulmonary œdema, where the fluid oozes from the capillaries in the alveolar walls. There seems to be some looseness in the use of the term "pulmonary œdema"; it is sometimes applied to cases where there is merely an excess of mucus secreted by the bronchi, a condition which usually responds to oxygen and atropine. We have never seen any lasting benefit result from these measures in true pulmonary œdema, and all but one of our patients with established widespread pulmonary œdema died. The non-fatal case is reported below.

We have tried to combat the œdema by the administration of hypertonic plasma in addition to the above-mentioned measures. This has been tried as a one-pint intravenous infusion of double-strength and of treble-strength plasma, but without any demonstrable effect.

CASE-RECORD

A man with a lacerated lung was admitted 6 hours after being wounded. His condition was becoming steadily worse. Severe pain, due to four fractured ribs with a large metallic missile lodged between the fractured surfaces, was preventing him from breathing except by shallow gasps. Pulmonary œdema was present, and it was thought that the difficulty in breathing was increasing the œdema. A thoracotomy was done in the hope that it would ease the pain and so break the vicious circle, but after operation the œdema was more pronounced. He was treated with continuous oxygen and given repeated injections of atropine sulphate. An attempt to combat the œdema was made by half-hourly intravenous injections of 20 c.cm. of triple-strength plasma. This treatment was initiated within an hour of his leaving the operating-theatre.

After 6 doses of the plasma his condition appeared to have slightly improved, but during the next 6 hours he became gradually worse, with widespread medium crepitations and impaired percussion notes all over the chest; he was cyanosed; he had a copious clear watery frothy sputum; his dyspnœa was extreme, with short sharp inspirations and relatively prolonged expirations; he was restless, clutching at his chest, and complained of a sense of suffocation. He was later mentally confused.

His circulation being still satisfactory and his blood-pressure 112/80 mm. Hg, venesection was decided on, and 1 pint of blood was rapidly withdrawn. Within an hour of this procedure there was striking improvement. He was less cyanosed, the respiratory rate had dropped from 50 to 40 per min., he was mentally clear and said that he felt relieved, and the moist sounds in the chest were definitely diminished. After 3 hours his respiration-rate was 32 per min., and with continuous oxygen he had lost his cyanosis. This improvement was maintained, and after 12 hours his respirations were 26 per min., he was not cyanosed, and the chest exhibited fine crepitations at both bases only. From then on he made an uneventful recovery.

DISCUSSION

The mechanism of the production of pulmonary œdema in penetrating wounds of the chest is not clear. For the condition to develop there must be an increase in the pressure differences between the alveolar capillaries and the alveoli and/or in the permeability of the walls of the capillaries. This can be brought about in various ways.

Anoxæmia may act in a twofold way: it can produce damage to the capillary endothelium of the alveolar capillaries, with an increase in permeability and leakage of fluid into the alveoli; and, by producing cardiac insufficiency, it can cause stagnation in the capillaries and a rise in hydrostatic pressure, thus further favouring transudation of fluid. Patients with penetrating chest wounds can become anoxæmic in several ways. "Shock" and hæmorrhage produce anoxæmia, and any local condition in the lung which interferes with gaseous exchange will further increase the anoxæmia. In this way the anoxæmia may become severe enough to lead to the cardiac and capillary changes mentioned above.

In cases with a laceration of lung tissue there are hæmorrhage into the alveoli and exudation into the surrounding areas. It is possible that the respiratory movements lead to dispersal of blood and exudate into other parts of the affected lung, and, in cases where there is partial compression, by aspiration into the contralateral sound lung, these irritants giving rise to widespread exudation into the alveoli and secretion of mucus in the bronchi. Most of the cases we have seen have occurred where there has been a laceration of lung tissue. On the other hand, cases with large pulmonary lacerations often show no signs of pulmonary œdema. It may be that here a rapidly developing hæmothorax or pneumothorax has collapsed the lung or affected lobe before any aspiration of blood and exudate into other parts of the respiratory tract could take place. It is true that hæmoptysis occurs in pulmonary tuberculosis, bronchiectasis, &c., without pulmonary œdema ensuing, but here the lesion is different; the hæmorrhage takes place from one point in a circumscribed area not in free communication with surrounding normal tissue.

Thoraco-abdominal wounds without damage to the lung are liable to develop pulmonary œdema. There is in these cases a tendency to develop a basal pulmonary collapse, due presumably to inadequate respiratory movements after operation, associated with a deficiently functioning diaphragm and obstruction by mucus. As the air beyond the obstruction is absorbed the intra-alveolar pressure falls and thereby favours the production of pulmonary œdema. This type of collapse is also favoured by the shallow breathing and restrained

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coughing which are so common in other conditions of the chest.

In cases where the mediastinum is not fixed, its displacement may cause cardiac inefficiency. A more important example of this is mediastinal "flapping" during an open thoracotomy.

It is likely that several of the above-mentioned factors play their part. Thus blood and other fluids exude at the site of the lung damage and are aspirated elsewhere if the affected part is not completely collapsed. These products, together with imperfect respiratory movements, may lead to some degree of absorption collapse with consequent lowering of intra-alveolar pressure. Anoxæmia, from its various causes, tends to reduce the efficiency of the heart and increase the permeability of the alveolar capillaries.

Whatever the cause, intravenous infusions of any type tend to produce pulmonary œdema, and this should always be borne in mind when there is any question of giving a blood-transfusion to a patient with a penetrating chest wound before, during, or after operation.

Although venesection is the usual treatment for pulmonary œdema of non-traumatic origin, we have in the past hesitated to use it, because the general condition of these patients has been such as to make the further reduction of their blood-volume inadvisable. In view of the apparently satisfactory circulatory condition of this particular patient, venesection was regarded as being unlikely to do harm. The result warrants a further trial even in cases where the effect of an already lowered blood-volume is evident, for death has been the invariable outcome in the past.

SUMMARY

Pulmonary œdema is the most serious complication in large lacerating wounds of the lung.

In spite of treatment with oxygen, atropine sulphate, and hypertonic plasma, all our cases were fatal but one.

The one surviving patient, after receiving the usual treatment, finally underwent venesection and within an hour improved dramatically.

The mechanism of the production of pulmonary œdema is discussed.

A warning is given against the use of intravenous infusions in severe chest injuries, since they tend to produce pulmonary œdema.

MESENTERIC VENOUS THROMBOSIS

RECOVERY AFTER RESECTION WITH HEPARIN

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MESENTERIC vascular occlusion is often unrecognised before laparotomy or autopsy. This may partly be because the condition is expected to present itself as a sudden abdominal catastrophe, with severe shock and pain and perhaps the passage of blood per rectum. Such a picture is likely to be produced only by sudden massive arterial occlusion and is by no means constant (see d'Abreu 1932). A slowly progressive venous occlusion might be expected to give rise to a different symptom-complex.

Whittaker and Pemberton (1938), reviewing 60 proved cases at the Mayo Clinic, demonstrated the wide differences in the pathological changes and signs of mesenteric vascular occlusion and showed clearly the variations in the presenting symptoms.

The arterial cases may be due to an embolus, usually from a cardiac vegetation, or to thrombosis in arteriosclerotic patients. The venous cases are thrombotic and may be ascending, from infective or strangulating processes in the gut, or descending, from portal thrombosis in hepatic disease or from thrombosis of the splenic vein in splenic diseases.

The case-mortality in all forms of this abdominal crisis is very high. Of Whittaker and Pemberton's 60 cases 57 were fatal. The prognosis in arterial cases is less unfavourable than in the venous ones, among which operative cures are extremely rare. It is easy to resect wide of the affected area of gut, but complete excision of the thrombosed mesentery is a different matter, for the superior mesenteric vein must not be too closely approached, and the trauma consequent on resection, however slight, is likely to produce a further spread of the thrombotic process centrally.

The case described here appears from a review of the published work to be unique, in that complete infarction developed in a case of thrombophlebitis migrans, although a less complete thrombosis, from which the patient recovered spontaneously, has been described in cases of this disease reviewed by Ryle (1930). The signs and symptoms of our patient were not recognisable as those of mesenteric thrombosis as described in standard surgical textbooks, and the condition was not diagnosed before laparotomy.

The successful outcome is ascribed to four precautions which were taken to guard against the risk of further infarction. (1) A wide excision was performed with removal of a wedge of mesentery. (2) After an end-to-end anastomosis of the cut ends, a side-to-side anastomosis between portions of gut a foot above and a foot below the junction was made, to act as a safety-valve if thrombosis occurred at the site of the repaired mesenteric gap. (3) Heparin was given to lessen the coagulability of the patient's blood. (4) Intramuscular penicillin was given in the hope that it might deal with any systemic infection causing the thrombophlebitis.

CASE-RECORD

A staff sergeant in the Belgian Army, aged 40, was admitted to the Westminster Hospital on Sept. 18, 1945, complaining of a dull heavy pain just below the xiphisternum. This had started suddenly on the morning of the 11th, and he had been kept in bed at a casualty reception station. The pain got less but still persisted, and he was sent to Westminster Hospital a week later. He had often brought up small amounts of a watery fluid but had not actually vomited.

His previous history was of a thrombophlebitis in the left internal saphenous vein just above the knee after a bruise in that region in October, 1944. While in bed with this, he had a severe massive collapse of the right lung from a pulmonary embolus, followed a week later by thrombosis of the right internal saphenous vein in the thigh.

Examination revealed generalised tenderness and resistance in the epigastrium. The rest of the abdomen was normal, but there was some tenderness on pressure on the left renal area. No mass could be felt, and the abdominal wall moved on respiration. Temperature 101° F, pulse-rate 80, and respirations 20 per min. Urine contained a trace of albumin and a few red cells, but no pus, casts, or bacteria. Pulse regular. Blood-pressure 130/80 mm. Hg. Heart-sounds normal. White-cell count 14,800 per c.mm. He was obviously in great discomfort, but no definite diagnosis could be made, and it was decided to keep him under observation as a possible case of subacute pancreatitis or high retrocæcal abscess.

He had been constipated before admission, but an enema next morning produced a good result. Gregerson's test of the stool for occult blood was negative. The result of a further enema on the 22nd was also apparently normal. His temperature gradually fell during the next five days, at the end of which time it was normal and his pulse-rate 70. His epigastric resistance had gone, but he still complained of epigastric pain and tenderness.

On the evening of the 24th, the seventh day after admission, he complained of much pain in his abdomen, and his chart showed a gradually rising pulse-rate and a temperature of 99° F. He had vomited, and an enema had produced only a small constipated stool of normal colour. His abdomen was resistant, tender all over, and moderately distended. No intestinal movements could be heard. A diagnosis of acute obstruction of small intestine was made, and the patient was taken to the theatre.

Operation.—The abdomen was opened, under light 'Nupercaine' spinal anæsthesia, through a left upper paramedian incision. A large quantity of bloodstained peritoneal effusion

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Fig. 1—About 3 ft. of upper ileum, bearing about 3½ in. of mesentery, removed from a case of mesenteric venous thrombosis.

escaped, and on preliminary manual exploration very hard rounded fæcal masses were felt in the transverse and descending parts of the colon (a similar finding had been noted in a previous case (d'Abreu 1932)).

Further search revealed a blackened and obviously gangrenous loop of gut roughly half-way down the small intestine, adjoining which was a thick œdematous hard mesenteric mass. A rapid exploration revealed no other intra-abdominal abnormality. The gut gradually shaded off on each side of the blackened portion. The sections adjoining the gangrenous part were intensely congested and oozing blood into the peritoneal cavity. A length of gut 3 ft. long, with as deep a wedge of mesentery as was deemed advisable, was then resected, the line of section being made about 6 in. away from any doubtfully coloured intestine at each end. On cutting the mesentery, it became clear that the thrombosis had extended beyond the line of section, for clot was extruded from the cut veins. An end-to-end anastomosis was performed and the gap in the mesentery closed; but, in view of the presence of thrombosed veins in the cut edge, it was decided to make an entero-anastomosis between loops above and below the junction to act as a safety-valve in case of further infarction. The abdomen was then closed without drainage and the patient returned to the ward with an intravenous drip of normal saline to which heparin in the proportion of 7500 units to each pint was added. Next morning his condition was good, temperature 99° F, and pulse-rate 100.

The heparin was continued in the intravenous drip and was increased to 15,000 units per pint on the second day. On the 8th day a slight oozing of fresh blood from the centre of the abdominal wound appeared, and it was thought advisable to stop giving heparin. The bleeding stopped next day, and his convalescence was thereafter uneventful.

The course of intramuscular injections of penicillin was continued until the 12th day, 2·1 mega units being given in all. His bowels acted with an olive-oil enema on the third day after operation and thereafter remained regular.

HEPARIN-RESISTANCE TEST

To adjust the dose of heparin to render the patient's blood temporarily incoagulable the following method was adopted, in preference to the ordinary methods of estimating coagulation time, which can be highly fallacious (Shafiroff et al. 1943).

Dilutions of heparin were made in normal saline so as to contain 100, 5, 2, 1, $^1/_5$, $^1/_{10}$, and $^1/_{100}$ units per ml. (10 units = 0·07692 mg.). A standard small volume (0·01 ml.) of each dilution was placed in a Dreyer's tube. A saline control of similar volume was included in the series. The ear was pricked to yield a free flow of blood, and with calibrated capillary tubes an equal volume of blood was added to the heparin dilution, well mixed, and drawn into the capillary tube again. The tubes were placed horizontally on a 'Plasticene' bed. As soon as a firm coagulum formed in the saline control tube, the test was read (see table). A + sign indicates that a firm clot had formed in the tube. Tests on normal controls were performed with the same batches of diluted heparin. It is seen that a normal blood can clot in the presence of 1 unit of heparin per ml. under the conditions of the test.

The patient's blood was tested on the first day after the operation and 7½ hours after receiving 7500 units of heparin per pint in a continuous saline drip, when the blood could clot in the presence of 2 units per ml. The dose was then increased to 15,000 units per pint of saline, and next day (26th) the patient's blood clotted in the presence of $^1/_5$ unit per ml. On Sept. 27 a further test was carried out; the patient's blood then clotted in the presence of $^1/_5$ unit again, and this dose was then maintained for eight days. At a further test on Oct. 24, when the patient had apparently recovered, his blood clotted in the presence of 2 units again. The patient's

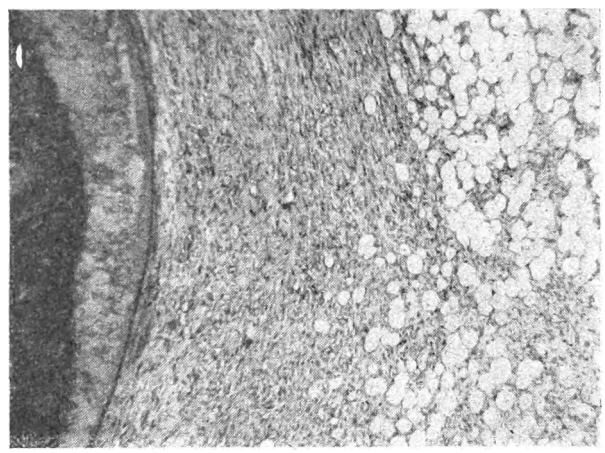

Fig. 2—Section of mesentery showing inflammatory exudate and swelling of intima of vein. (× 36.)

RESULTS OF HEPARIN-RESISTANCE TESTS

—	Date	Heparin units* per ml.									Remarks
		1/100	1/50	1/10	1/5	1	2	5	10	100	
Present case	Sept. 25	+	..	+	+	+	+	—	—	—	Heparin dose = 7500 units/pint
	Sept. 26	+	+	+	+	—	—	..	—	—	Heparin dose = 15,000 units/pint
	Sept. 27	+	+	+	+	—	—	—	—	—	Platelets 323,000, white cells 12,000 per c.mm.
	Oct. 24	+	+	+	+	+	+	—	—	—	Apparently recovered
Five normal controls ..	As above	+	+	+	+	+	—	—	—	—	—
Hæmophilia (aged 25)	Sept. 26	+	+	—	—	—	—	—	—	—	Clotting-time, 30 min.
Anaphylactoid purpura (aged 9) ..	Dec. 7	+	+	+	+	—	—	—	—	—	Platelets 250,000 per c.mm.

* 1 unit = 0·07692 mg. + = coagulation. — = mixture fluid. .. = dilution not tested.

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blood seems to have contained an excess of anti-heparin (thrombokinase ?).

The table also contains the results of the tests performed in a patient with hæmophilia and in one with anaphylactoid purpura. In these cases the presence of heparin-like substance is demonstrated in the blood; alternatively, the thrombokinase content of the blood is diminished.

PATHOLOGICAL FINDINGS

The specimen (fig. 1) consisted of a piece of the upper ileum approximately 3 ft. long, bearing about 3½ in. of mesentery. About 8 in. from the upper end there was an area of gut 12 in. long, dark plum coloured, oozing blood from the peritoneal aspect. The gut for 6 in. distal to this was much congested and somewhat dilated. This area merged imperceptibly into healthy gut. The mesentery was very œdematous, and the lymphatics were very prominent.

Running parallel to the damaged area was a large vein which was about ½ in. in diameter and contained a laminated coagulum. The proximal end of this vein, which contained much more recent clot than its distal end, had been divided in the fringe of resected mesentery. The small veins leading into it from the damaged gut contained recent clotted blood.

On section, the mesentery everywhere contained an acute inflammatory exudate (fig. 2). Several sections were taken of various veins in the mesentery. Their walls show various degrees of change similar to those of the large vein previously mentioned. In the large vein the intima at one point is swollen

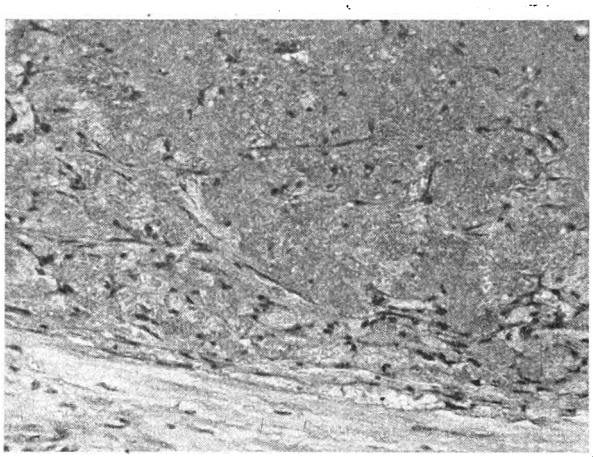

Fig. 3—Section of clot showing organisation and recanalisation.

(fig. 2). The clot is not all of the same age. The peripheral portion shows invasion by fibroblasts and new capillary formation (figs. 3 and 4). The vein wall is infiltrated and shows many dilated capillaries and inflammatory cells merging into the general mesenteric exudate. The arteries were quite healthy. No bacteria were seen in gram-stained sections.

The lesion appears to be essentially an intimal degeneration, followed by thrombosis with subsequent reaction throughout the vein coats. The appearances also suggest that there had been a preliminary incomplete thrombosis followed later by complete occlusion.

DISCUSSION

Spontaneous recovery from attacks of mesenteric thrombosis in thrombophlebitis migrans, which Ryle (1930) surmised might happen, and which may occur in thrombosis from other causes, is shown to be possible by the striking picture of older mural clot with evidence of recanalisation in the present case. This also explains the long course of this patient's illness before a completely obstructing clot produced acute intestinal infarction and the signs and symptoms of an intestinal obstruction. The pain in the loin, and the albumin and red cells in the urine, can perhaps be explained by a concurrent renal thrombosis.

It seems clear from the heparin-resistance tests that the patient will be liable to further clotting, and he has been told to carry about with him a note from us urging his

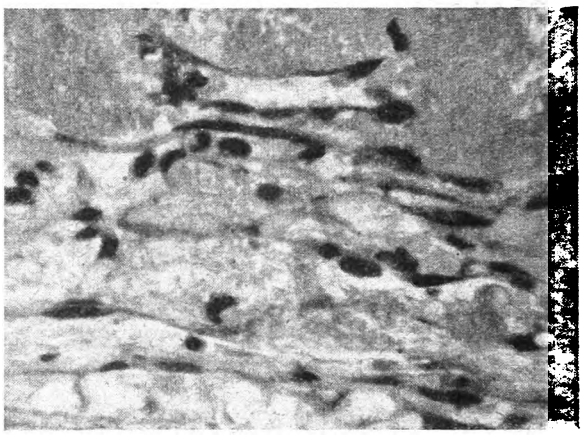

Fig. 4—Section of clot showing newly formed capillaries.

medical attendant to use heparin or dicoumarol if this should occur.

From a consideration of this case and the results obtained by the new method of titration of coagulability described here, we advocate the following procedure in all cases where dangerous complications of thrombophlebitis are likely:

(1) Administration of heparin intravenously. Dicoumarol preparations are not recommended for the following reasons (Allen et al. 1942): (*a*) the delay before their effects on the prothrombin time are produced; (*b*) their tendency to produce untoward bleeding; and (*c*) the difficulty of reversing their effect if desired, whereas the action of heparin can be neutralised immediately by the intravenous injection of protamine sulphate (Jorpes 1941). The administration of heparin should be continued till some days after the temperature has fallen to normal.

(2) A daily estimation, by the method described, of the patient's heparin resistance should be used to control the dosage so that a result of $^1/_6$ of a unit is given by the test.

(3) Owing to the obvious difficulties of maintaining continuous intravenous therapy for a long period, intermittent injections given with Olafson's needle (Rosenqvist 1941), which is an intravenous needle fitted with a rubber diaphragm, seems to be the most suitable method of administering heparin.

SUMMARY

A successful case of resection of the small intestine for mesenteric venous thrombosis is described.

A new method of titrating the coagulability of a patient's blood, using heparin solutions of decreasing strength, is preferred to the estimation of coagulation time.

The use of heparin is urged in cases of thrombophlebitis when dangerous complications are feared.

Our thanks are due to Dr. R. J. V. Pulvertaft, O.B.E., pathologist to Westminster Hospital, for his advice and suggestions with the pathological work described in the article, and to Mr. G. H. Macnab, in whose wards the patient was admitted, for permission to publish this case.

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Medical Societies

NUTRITION SOCIETY

ON March 2 the Scottish group met in Glasgow to discuss the

Rôle of Nutrition in Social Medicine

Prof. T. FERGUSON (Glasgow), chairman at the morning meeting, pointed out that food and the nutritional well-being of the people were major social problems long before there was much formal conception of social medicine. He gave a brief account of food conditions in Scotland from the 16th century. Fortunately, he said, much progress has been made in the past hundred years and nutrition is now generally recognised to be one of the basic issues of social medicine.

Prof. E. P. CATHCART, F.R.S. (Glasgow), said that in discussing the problem of food the two main phases of the subject should be separated—namely, (1) alimentation, which is the provision of food of adequate quality and quantity, and (2) nutrition, which only in part depends on the diet. He recognised the difficulty of finding a yardstick for nutrition, but was dissatisfied with the modern emphasis on increased height and weight. Mere size is no guide to nutrition: the athlete who appears thin to the verge of emaciation may be in perfect training and presumably in a state of optimum nutrition. Good nutrition is the end-result of perfect environmental conditions in the widest sense, including adequate food, sleep, play, housing, and psychosomatic relationships. Moreover it is not a fixed and static state but a fluctuating one.

Unless the composition of the diet is known, the number of calories has little meaning, since calories themselves have no nutritive value. Vernon has shown that people do not work at a steady pace throughout their working day, and that the duration of the voluntary rest pauses is directly proportional to the severity of the work; so that, whether the work is heavy or moderate, the actual amount of work done varies less in total energy demand than might be assumed from a casual inspection of the performance. In actual fact, the amount of work done does not differ very much between light and heavy work, because when a person is doing very heavy work the rest periods are longer.

Probably the virtue of first-class protein is that its chemical make-up closely resembles that of human tissue protein and therefore its inclusion in the diet spares metabolic waste. From his experience of dietary surveys, Professor Cathcart deduced that very few diets contain less than 30% of first-class protein. In any case Mitchell of Illinois has shown that proteins can supplement each other in the diet: thus a combination of beef protein (biological value 66) with flour protein (biological value 55), in the ratio of one of the former to two of the latter, gives a combined biological value of 73. These results speak unequivocally for the need of variety in diets, or of a good mixed diet.

There is evidence that maximum growth does not make for health and longevity. In experimental animals growth is rapid, whereas in man it is slow. Generally speaking, therefore, food in man will have less influence on growth than might be anticipated from experiments on laboratory animals. In addition in man there is always the primary factor of heredity to reckon with. There is no doubt that if the food consumed is inadequate in quality and quantity, growth may be temporarily retarded, but the potential ability to grow is retained for long periods. Hardy, studying a representative group from an industrial area, found no evidence of any general retarding influence of illness per se on physical growth.

No adequate explanation has yet been found as to why people doing hard muscular work demand a high intake of meat. It cannot be required for tissue maintenance, since even with the hardest worker, if the energy requirements are provided for, the extent of muscle breakdown as evidenced by increased nitrogen output is small. Nor does muscular work seem to be carried out more effectively on high-protein diets than on normal ones. It is a fact, however, that the more virile races of the world are all large consumers of meat, and an investigation into the diets of the 4700 athletes of the 40 nations attending the Olympic Games at Berlin in 1936 showed that the great majority of the athletes were large consumers of animal protein.

In conclusion Professor Cathcart said he thought most of the figures published for the vitamin requirements are on the high side. In the study of nutrition the greatest need of today is more and better experiments on human beings.

NUTRITION DURING THE WAR

Prof. G. M. WISHART (Glasgow) presided over the afternoon meeting.

Dr. NORA WATTIE (Glasgow) spoke on the nutrition of women and children during the war. It is difficult, she said, to evaluate properly the effects of bad feeding, bad housing, and overcrowding on health. The war permitted a great biological experiment; for, though overcrowding and housing became worse, increase in employment, food rationing, and subsidies brought rationed food within the reach of all. The death-rates of women and children in general fell throughout the war, and dental caries diminished among pre-school and school children. Anæmia among pregnant women was less common, presumably because of the increased intake of iron since national wholemeal flour was introduced in 1942; but in cases still exhibiting anæmia iron therapy seemed unsatisfactory. The continuing failure of women to breast-feed their infants is disappointing, but since the diet is reasonably adequate it probably has a psychological basis. The rarity of even mild rickets in children under a year old she attributed to the increasing consumption of national dried milk, which is fortified with 800 international units of vitamin D per pint of reconstituted milk. As regards the toddler, however, the position is less satisfactory: where husband and school-children take some meals out rather than at home the women do not trouble to make food for the toddler, who suffers in consequence.

Dr. J. PEMBERTON (Sheffield) discussed the difficulty of isolating the nutritional from the environmental factors giving rise to disease. The principal factors coming into the problem are nutrition, housing, occupation, the use of leisure, and the emotional relationship between the patient and his family.

INDIA

Dr. ANGUS THOMSON (Rowett Institute, Aberdeen) said that 30% of Indians do not get enough to eat, and that nearly all consume too little of the protective foods. Population pressure on the available fertile soil is already high, and famine readily follows a poor harvest. The only immediate solution lies in increasing food-production rapidly by applying modern techniques. The Famine Inquiry Commission holds that solution of the population problem depends on raising the standard of living.

Although, as McCarrison showed, the best Indian diets can produce excellent physique, such diets are rarely consumed. In the Indian army, recruits of a high physical standard are surprisingly scarce even in peace-time, and the physique of recruits deteriorated during the war. Their response to good feeding was very encouraging, but it was difficult to provide an ideal ration, and such success as was achieved necessitated an elaborate scheme for food-production and distribution, aided by imports. It was proved, however, that Indians of all classes would eat a nutritious diet when provided. On the Burma front, where malaria was hyperendemic, many Indian troops developed a form of secondary malnutrition with severe anæmia, wasting, and diarrhœa. There is some evidence that a relative deficiency of some unknown nutrient (probably contained in meat, very little of which was available even for non-vegetarian Indians) predisposes to acute nutritional failure under conditions of physiological stress.

India now faces renewed famine, but no scheme for increased food-production will have the positive support of the Indian masses until there is political calm and a popular government. Several expert committees and commissions have recorded their views, and there is no reason why practical reconstruction should not start at once. But the chief driving power must ultimately come from Indians themselves, and education must surmount political and religious obstacles to achieve this end.

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INCOME AND NEEDS

Mr. BARNETT WOOLF, PH.D. (Edinburgh), said that for many years the recognised standard of inadequacy of income in Britain was the "poverty line." This was originally devised by Rowntree for his survey of York in 1899, and it was adopted, with minor modifications, for surveys of other towns by Bowley and others until the 1930's. Rowntree made out a working-class budget with the cheapest possible diet giving the requisite calories and protein, vitamins being then unknown. He added a minimal allowance for clothes (assumed to be bought second-hand) and for fuel, and 2*d*. a head for everything else. He made it clear that he did not put forward his poverty line as a standard of sufficiency, but subsequent workers came to regard it as "adequate." For a couple with three children the poverty line, at 1936 prices, was about 38*s*. a week. This sum formed the tacitly accepted maximum for employment benefit and other cash payments under the growing system of social services.

Rowntree made the first departure by publishing a considerably higher standard, the "human-needs" line, as the least a human being could possibly be expected to live on. Then, in the crisis years of the 1930's, nutritional scientists, social reformers, and agriculturists joined in a movement to abolish malnutrition and gluts of food by raising the nutritional level of the people. Out of this came the diets proposed by the British Medical Association and League of Nations. Unfortunately the B.M.A. report on nutrition suffered from several grave faults: (1) the diets were not, as the report admits, at the optimal nutritional level; (2) the lists of foodstuffs were impracticable from the housewife's point of view; (3) the prices given were 10–20% too low; and (4) the widespread adoption of the diets would have greatly diminished, instead of increasing, the national consumption of butter, eggs, meat, fruit, and vegetables.

In 1942 the Beveridge report was published, with a scale claiming to represent a scientifically determined standard of adequacy. The food allowance was said to be enough to buy the League of Nations diet; but actual costing shows that it fell considerably short, and was in fact at about B.M.A. level. For all other items, the old poverty-line figures were adopted almost unchanged. The result is a sum of 53*s*. a week for the standard family of parents and three children at 1938 prices, exactly the same as Rowntree's human-needs budget, which, according to its own author, is well below the minimum for full well-being. In order to spend the prescribed 30*s*. 9*d*. on food, the standard family on the Beveridge scale would be laying out about 58% of its income on this item, whereas in fact the average working-class family spends about 40–45% of its income on food. Families on the Beveridge scale would not in general reach the nutritional standard postulated in the report.

In Dr. Woolf's opinion the method of constructing standard budgets, with relative distributions of expenditure widely different from those that obtain in real life, is unrealistic. The only way to assess nutritional adequacy is Orr's method—to find out how people actually spend their money, and at what income level their food purchases reach the standard of sufficiency in all constituents. The Beveridge and Griffiths scales may or may not be the best that can be afforded, under the present economic conditions, in a practical scheme of social security. But in no sense whatever are they scientifically determined standards of adequacy of food, clothing, housing, or anything else.

Reviews of Books

Trauma in Internal Disease

RUDOLF A. STERN, M.D., assistant attending physician, City Hospital, N.Y. London: Heinemann. Pp. 575. 30*s*.

NATURE is not an exact experimentalist, for she includes so many variables. It is sometimes easy to associate trauma with a disease event, sometimes difficult in the extreme. The literature of the subject, widely scattered in many languages, has often been coloured by bad logic. An attempt to collect and review it is courageous, and Dr. Stern has done it remarkably well in a book of outstanding moral quality. He distinguishes clearly between circumstantial and factual evidence, inference and scientific conclusion, and negative and positive observation, drawing reasonable conclusions and avoiding controversy. He has reviewed experimental, clinical, and pathological observations relating trauma with disease over a wide field; more than 2000 cases are considered individually, the text roaming from infectious diseases to general problems of metabolism and endocrinology. A chapter on traumatic pneumonia and sections on coronary disease, diabetes, and the blood diseases show that it is up to date. A triple index (bibliography, author, and subject) makes reference easy.

Treatment in General Practice

(5th ed.) HARRY BECKMAN, M.D., professor of pharmacology, Marquette University, Milwaukee, Wisconsin. London and Philadelphia: W. B. Saunders. Pp. 1015. 50*s*.

THIS subject needs detail and authority. Professor Beckman modestly writes, "the true authors of this book are those men and women whose names appear in the Bibliography"; and whenever possible he has presented their work in their own words. At the same time he is critical and constructive; he does not like enthusiasts, and never records unreliable or unconfirmed work without strong warning. At times he almost seems to be too set on "debunking" an empirical or traditional treatment, but his attacks are fundamentally sincere. Among new chapters is a good one on the toxic and other effects of sulphonamides. Few methods or aspects of treatment have escaped him. Whether discussing the common cold or "colon consciousness" (as he prefers to call constipation, mucous colitis, enteroptosis, or spastic colon) he is informative, brisk, individual, and not very tolerant of the other man's jargon. Speaking of essential hypertension for example, he writes with a touch of scorn: "The psychosomatic fellows express about the same thing, but in their own weird fashion, which I suppose we must try to understand."

This book is one which all practitioners will be glad to turn to, and many will appreciate the clear and business-like way its help is given. There is no lack of decision or emphasis.

New York Hospital

A History of the Psychiatric Service, 1771–1936. WILLIAM L. RUSSELL, M.D., emeritus professor of psychiatry, Cornell University. New York: Columbia University Press. London: Oxford University Press. Pp. 556. 50*s*.

THE remarkable growth of American psychiatry in the 20th century is well shown in this book. Until then the development of a hospital such as Bloomingdale ran parallel with that of comparable English and French institutions, but the Payne Whitney Clinic is the symptom of a more ambitious effort than other countries can yet exhibit, or probably for some time afford. The ups and downs of the New York Hospital have clearly depended, however, on the abilities of the physicians in charge and the extent to which the governors gave them proper support; the staffing of the Payne Whitney Clinic showed again how much more difficult it is to find the right men than the right buildings. The history of the New York Hospital, so admirably told here, is a stimulating record of progress and achievement.

A Guide on Alcoholism for Social Workers

ROBERT V. SELIGER, M.D., assistant visiting psychiatrist, Johns Hopkins Hospital, Baltimore, in collaboration with VICTORIA CRANFORD. Baltimore: Alcoholism Publications. Pp. 94. $2.

Alcoholics are Sick People

ROBERT V. SELIGER. Publishers as above. Pp. 80. $2.

THESE two medical tracts are unpretentious and simply expressed accounts of how most psychiatrists in America now view alcoholism. Though the picture of what treatment can achieve, and particularly of the part the Rorschach test can play in determining treatment, is too rosy, the books could well be put in the hands of addicts and their relatives or advisers. The guide for social workers is the more detailed of the two, and is composed of papers read before medical and other audiences.

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THE LANCET

LONDON: SATURDAY, APRIL 13, 1946

Periodicity of Influenza

EPIDEMIOLOGISTS have spilt much ink in the effort to show that influenza epidemics recur in some sort of regular sequence. Most famous are BROWNLEE'S attempts to demonstrate an underlying 33-week cycle. Earlier workers, however, were handicapped in that they did not know of the existence of two different agents, influenza viruses A and B, antigenically unrelated but each capable of producing widespread outbreaks. The United States commission on acute respiratory diseases [1] has lately been analysing the sequence of outbreaks in America since 1920 in the light of present knowledge. They take the excess annual death-rates from influenza and pneumonia in 90 cities and plot them week by week over 25 years. The peaks occur with bewildering irregularity. The curve is then analysed on the assumption that the outbreaks are all caused by either virus A or B, influenza A having a cycle of periodicity of 2–3 years and influenza B a longer one of 4–6 years. There now appears something approaching regularity, as the table shows.

Year	Supposed causative virus in U.S.A.		Year	Virus prevalence in U.S.A.		in Britain
1922	..	B	1933	A ?	..	A
1923	A	..	1934	..	..	..
1924	..	..	1935	A	..	(A)
1925	..	..	1936	..	B	..
1926	A	..	1937	A	..	A
1927	..	..	1938	..	..	..
1928	..	B	1939	A	..	(A) (B)
1929	A	..	1940	..	B	..
1930	..	..	1941	A	..	(A)
1931	A	..	1942	..	..	..
1932	..	B	1943	A (autumn)	..	(B) (spring) A (autumn)
			1944	..	..	..
			1945	..	..	..
			1946	..	B	B

The left-hand part of the table is wholly conjectural so far as it implies that one or other virus was a cause of trouble, for neither virus was recognised before 1933. The guesses are, however, reasonable ones, considered as extrapolations from data obtained in more recent years. The right-hand part of the table is more trustworthy, for the viruses concerned were (apart from the American "A" record of 1933) actually identified. It will be noted that the A outbreaks were in step on the two sides of the Atlantic. British workers have emphasised that some epidemics (those in parentheses) were minor ones, and the figures from America show that there also the 1933, 1937, and 1943 outbreaks were larger than the intervening ones. This winter we have been sharing with our American friends the experience of a B outbreak, but hitherto there has been less evidence of correspondence between the two countries in epidemics of influenza B than of A. So far as we know, B has never been very troublesome in this country before this winter.

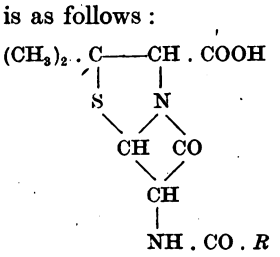
Are we now any nearer forecasting the future? Not, we fear, very accurately. The U.S. commission thought that the chances favoured an A outbreak in the winter of 1945–46 and a widespread outbreak of B "before the summer of 1946." According to present information, their forecast was wrong as regards A but right as to B. If their interpretation of their curves is correct, both viruses were behaving fairly regularly between 1928 and 1941, B turning up every fourth year and A every other year in that period, the epidemics never coinciding. Since 1941 there has been less stability, with fortunately a tendency to less frequent manifestations of activity by either virus. It would be justifiable to lay odds against a recurrence of B next winter, but the outlook as regards A is obscure. We may, however, have a pointer before the autumn. In 1943 scattered small outbreaks of A during the late spring and summer led up to the autumn A epidemic. Similarly B in America gave evidence of its activity in the summer of 1945 before becoming widely prevalent in the following winter. Localised occurrences of flu in the summer months are clearly worth watching.

1. *Amer. J. Hyg.* 1946, **43**, 29.

Chemistry of the Penicillins

INTENSIVE research on the chemistry of the penicillins has been carried out during the war on both sides of the Atlantic, but in 1943 a publication ban on all this work was imposed by the British and American governments. The ban is now being lifted. To coördinate the chemical investigations on penicillin in Britain, the Medical Research Council set up a committee, representing the various academic and industrial groups involved, and the corresponding work of chemists in the U.S.A. was coördinated by the Office of Scientific Research and Development. Since March, 1944, a complete exchange of information between the British and American groups has been established. Recently a preliminary statement of the main results of this collaborative Anglo-American effort was published simultaneously in *Science* [1] and *Nature*,[2] and it is hoped that a full account will be published in the form of a comprehensive Anglo-American monograph later this year.

The most important result of the Anglo-American work is that the chemical structure of the penicillins has been completely elucidated. They are dipeptides of a special type, possessing a common nucleus but different side-chains. Their general structural formula is as follows:



where *R* varies in the different penicillins. So far four different penicillins have been obtained in the pure crystalline state. In England they were designated as penicillins I, II, III, and IV, in accordance with the historical order of their discovery; in the U.S.A. they were termed F, G, X, and K. In penicillin

I (F) *R* is Δ^2-pentenyl $CH_2CH_2 . CH{=}CH . CH_2$-
II (G) ,, ,, benzyl $C_6H_5CH_2$-
III (X) ,, ,, *p*-hydroxybenzyl $OH . C_6H_4 . CH_2$-
IV (K) ,, ,, *n*-heptyl $CH_3CH_2CH_2CH_2CH_2CH_2CH_2$-

The probable structure of the penicillin molecule was derived by chemical degradation and synthesis of

1. *Science*, 1945, **102**, 627.
2. *Nature, Lond.* 1945, **156**, 766.

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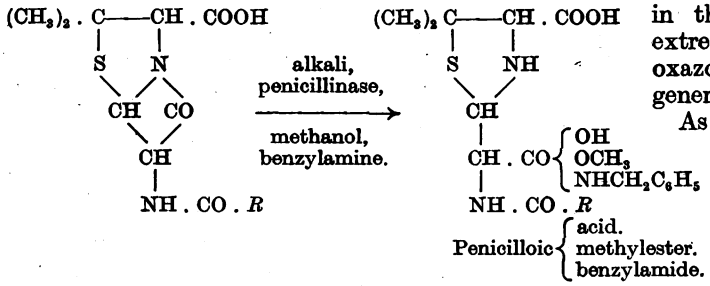
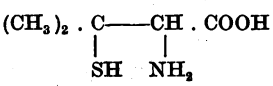
model compounds. Finally it was proved conclusively by crystallographic X-ray studies on single crystals of the potassium and rubidium salt of penicillin II, which led to accurate measurements of the bond distances between all the atoms of the penicillin molecule.

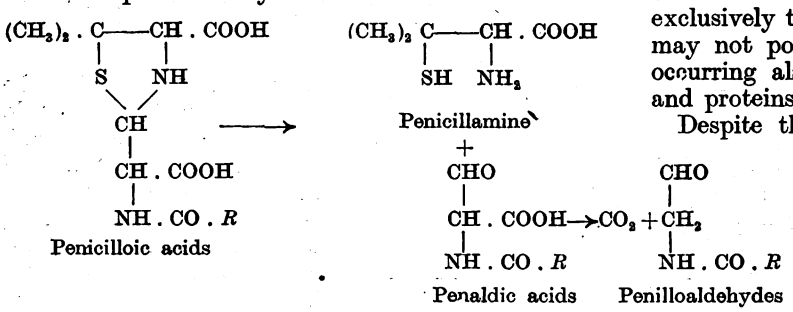
The unique feature in the penicillin formula is the four-membered "β-lactam" ring, a structure so far not encountered in any other biological material. This four-membered ring is opened easily by alkali, primary alcohols and amines, certain thiol compounds (e.g., cysteine), and the enzyme penicillinase which is present in some naturally resistant bacteria. This ring fission is the cause of the high instability of the penicillins towards these reagents. The open chain compounds, formed by fission of the four-membered β-lactam ring, are thiazolidines which have been termed penicilloic acids. By the action of alkali and penicillinase on sodium penicillin the salts of the penicilloic acids are formed; methanol inactivation of penicillin produces mono-methyl esters, inactivation by benzylamine mono-benzylamides of the penicilloic acids.



With mercuric chloride the penicilloic acids (or their derivatives) are decomposed into a thiol amino-acid "penicillamine"—



(ββ-dimethyl-cysteine) and aldehydo-acids, "penaldic acids" (or their derivatives). The free penaldic acids, being β-carbonyl acids, are unstable and decompose spontaneously into carbon dioxide and aldehydes, termed "penilloaldehydes"



Penicillamine, the constituent of the penicillin molecule common to all penicillins, belongs to the series of amino-acids with the unnatural *d* configuration. The structure of penicillamine, the penicilloic acids and many of their derivatives, and derivatives of the penaldic acids and the penilloaldehydes have all been proved by unequivocal synthesis as well as by degradation.

One of the most characteristic chemical properties of the penicillin molecule is the ease with which it undergoes intramolecular rearrangement. This faculty of rearrangement is illustrated in the two following examples:

(1) It is well known that the penicillins rapidly lose their antibacterial power when kept for a short time and at room temperature in a weakly acid medium. This biological inactivation of the penicillins by acid is due to the formation of isomeric compounds termed "penillic acids." The penillic acids are converted by alkali into "isopenillic acids," and by mercuric chloride into substances containing a free SH group and termed "penillamines." The penillic acids, isopenillic acids, and penillamines are imidazol derivatives all of which have been synthesised. (See formula A on opposite page.)

(2) The methylester of penicillin II is transformed into the isomeric methylester of "penicillenic acid" by the action of mercuric chloride at room temperature in non-polar solvents. The penicillenates contain the five-membered azlactone ring, and on alkaline hydrolysis afford the sodium salt of 2-benzyl-4-hydroxymethylene oxazolone. (See formula B on opposite page.)

These two rearrangements are very unusual and could hardly have been predicted from the known reactions of organic chemistry. The amide groups such as are present in the side-chains of the penicillins are known to be relatively non-reactive; yet in the penicillin molecule they can react under extremely mild conditions to form an imidazol or an oxazolone ring. These reactions are of considerable general biochemical interest.

As might have been expected from their biological properties the penicillins have proved to be an entirely novel type of molecule, not resembling any known synthetic or natural antibacterial product. Their structure is relatively simple: they are peptides made up of two simple amino-acids, dimethylcysteine and an acylated serine, the alcoholic group of which has been oxidised to the corresponding aldehyde. Through the incorporation in a novel manner of a peptide linkage into a four-membered lactam ring, the molecule has acquired its unique biological and chemical properties. This is, indeed, an astonishing fact which no chemist could ever have predicted. The peptide nature of the penicillin molecule makes understandable its complete non-toxicity to animal tissues. One is naturally tempted to ask whether the occurrence of a β-lactam ring in nature is limited exclusively to penicillin or whether this configuration may not possess a broader biochemical significance occurring also in other biologically active peptides and proteins.

Despite the apparent simplicity of the penicillin molecule it has not so far been possible to achieve a workable method of synthesis, although many efforts to this end have been made by competent chemists. However, the production of penicillin by the natural fermentation process has now become so cheap that the synthesis of penicillin is a problem of more academic than practical importance. It may in fact be difficult, if not impossible, ever to devise a synthetic process which can compete successfully with biological production.

Whenever a new type of chemotherapeutic agent is discovered one of the main aims of the chemists is to improve its properties by chemical modification of the molecule. In the absence of a synthesis for the complete penicillin molecule the only possibility for

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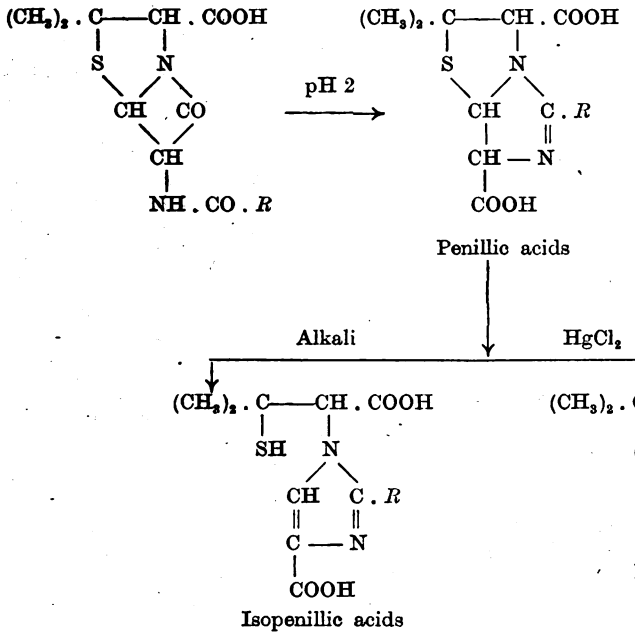
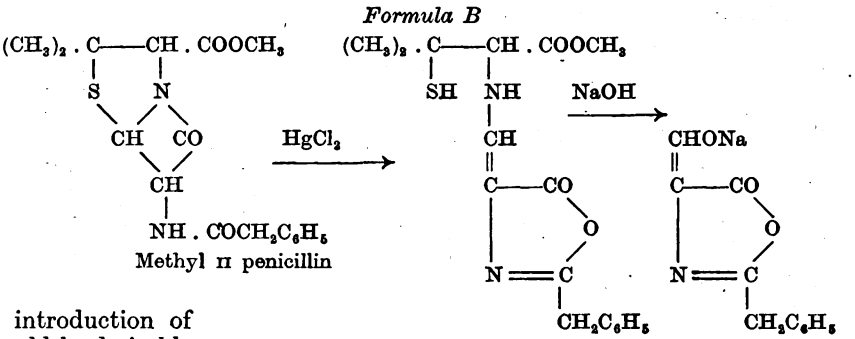
Formula A



getting modified penicillin that has to be considered at present is chemical alteration of the natural penicillins. From their chemical structures it would appear that penicillins I, II, and IV do not lend themselves to any chemical modification of their molecules. Penicillin III, however, possessing a *p*-hydroxybenzyl side-chain, would seem to offer considerable scope for chemical modification by introduction of new groups into the side-chain. It would be desirable to improve the properties of the penicillins in three directions: (1) to increase the range of susceptible bacteria; (2) to increase their stability; and (3) to reduce their rate of excretion. Can such improvements be achieved by modification of the side-chains in the penicillin molecule? The evidence available from the studies of the four natural penicillins with different side-chains suggests that with regard to (1) and (2) there is little prospect of success. All four penicillins attack the same type of bacteria and only minor quantitative differences in their bactericidal power have been observed; they all possess roughly the same degree of stability towards acid and alkali and the enzyme penicillinase. With regard to (3), however, it would seem possible that systematic work on the introduction of suitable groups into penicillin III may lead to modified semi-synthetic penicillins that are excreted less rapidly than the original natural products. To achieve success in this line of work it will first be necessary to develop fermentation methods which will make penicillin III more plentiful than it now is. A promising advance in this direction was lately reported by K. B. RAPIER and D. F. ALEXANDER of the U.S. Department of Agriculture to the American Association for the Advancement of Science. By exposing a culture of *P. notatum* to ultraviolet radiation they have isolated a new strain which gives a high yield of penicillin with at least half of it in the X or III form. The best yield of penicillin III from strains previously tested was a fifth of the total. It is not yet certain that the change in the fermenting capacity of the new strain is the result of the irradiation, but this seems probable.

Formula B



It is clear that an outstanding piece of work has been accomplished which has brought to light many new facts of absorbing chemical and biochemical interest, extending far beyond the limited field of penicillin chemistry.

Cardiac Catheterisation

IN 1929 FORSSMANN [1] had a ureteric catheter passed through the basilic vein into his own right auricle. Two years later, MONIZ, DE CARVALHO, and LIMA [2] were using the method in Lisbon for the injection of radio-opaque material into the right heart to outline the vessels at the lung root; and in Paris in 1936 AMEUILLE and his colleagues [3] applied the technique to 60 patients. All this was done without mishap, but in each case the catheter was in position for only a few minutes. In 1941 COURNAND and RANGES,[4] basing their confidence on animal experiment, had the courage to pass catheters into the right auricle in man and to leave them in situ for an hour or so while observations were made on the effect of various influences on the heart. The method enables pressures in the right heart to be measured, and, by analysing the gas content of blood from the right heart, the cardiac output can be calculated by the Fick method. Following COURNAND'S leadership a steadily increasing number of schools are now employing this remarkable method in cardiovascular studies. In June, 1945, under COURNAND'S chairmanship, the American Physiological Society held a symposium on cardiac output [5] in which it was announced that over 1200 cardiac catheterisations had been done in America and England without mishap. The method seems to be safer than either lumbar puncture or gastroscopy, and to carry no more risk than the

1. Forssmann, W. *Klin. Wschr.* 1929, 8, 2085.
2. Moniz, E., de Carvalho, L., Lima, A. *Pr. méd.* 1931, **39**, 996.
3. Ameuille, P., et al. *Bull. Soc. méd. Hôp. Paris*, 1936, **60**, 729.
4. Cournand, A., Ranges, H. A. *Proc. Soc. exp. Biol., N.Y.* 1941, **46**, 462.
5. Cournand, A. *Fed. Proc.* 1945, **4**, 183, 207.

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insertion of a cannula into a vein for intravenous infusion.

The field of investigation opened up by this new technique is enormous. Optical pressure curves have been obtained from the chambers of the right heart,[5] and the conditions of total respiratory gas exchange in lungs and tissues measured. Not only the output but the work of the heart can be calculated from the product of cardiac output and mean arterial pressure. This method will certainly revolutionise our ideas on cardiovascular problems within the next few years; already it has given results which are disturbing to many of our older notions. The first application of the method during the war was to a study of traumatic shock and hæmorrhage. The findings of the American workers have been reviewed by RICHARDS [6] and of the British observers by MCMICHAEL.[7] When shock results from hæmorrhage, the venous filling pressure of the heart falls with a parallel fall in the cardiac output (Starling's law); there is some vasoconstriction, but if a fainting reaction is superadded intense vasodilatation takes place in the skeletal muscles.[8] In shock from severe infection there seems to be a diminished filling of the right heart from falling venous tone without significant reduction of blood-volume.[6] In burns, the state is different; although there is a low blood-volume, with hæmoconcentration and a low cardiac output, the filling pressure of the right heart is high, and for a time at least the arterial pressure may be well maintained. RICHARDS [6 11] thinks that this indicates an extreme vasoconstrictive state affecting both arteries and veins and accompanied by some action on the myocardium itself. Further analysis of these differences in various types of shock is required to clarify the new problems which these studies have uncovered.

In heart failure the opportunities for detailed study are greater than in traumatic shock where the urgent need for treatment precludes much preoperative investigation. Cases of valvular, arteriosclerotic, and hypertensive heart disease finally reach a stage at which the venous pressure is high and the cardiac output low.[9] It is a striking fact that the output of the heart in such cases seldom falls below 3 litres per minute (from the normal 5 litres). This holds even in patients who are within an hour or two of death; in the dying cardiac patient the blood returning to the right heart is thus still half saturated with oxygen. This makes one wonder why the body tissues cannot continue to abstract the oxygen they need from the circulating blood. Cases of severe anæmia, on the other hand, have been shown by SHARPEY-SCHAFER [10] to require a very high cardiac output—up to 12–14 litres per minute—and at this stage patients may develop a high venous pressure. The raised venous pressure seems to be the main factor determining the high cardiac output in accordance with Starling's law of the heart. None the less, it may be associated with the general signs of congestion and œdema. This "high output" type of heart failure is also seen in emphysema,[9 11] a high rate of blood flow through the tissues being perhaps necessitated by the low tension of the available oxygen in the arterial blood. EDHOLM, HOWARTH, and MCMICHAEL [12] have recently shown that in gross generalised Paget's disease the bones may be so highly vascular that a high cardiac output is required, and this state also may be accompanied by a high venous pressure and œdema. The importance of recognising these two groups of low-output and high-output heart failure is shown in a study of the action of digitalis by MCMICHAEL and SHARPEY-SCHAFER.[9] Digitalis lowers the venous pressure and thereby also lowers the cardiac output of normal persons and of patients with anæmia, cor pulmonale, and Paget's disease with venous congestion [12]; in such cases it is unlikely to produce any clinical benefit. In cases of low-output heart failure, however, lowering of the venous filling pressure of the heart by any means will often be followed by a rise in cardiac output. The heart under these circumstances seems to be overstretched by the venous filling pressure, and relief from this venous overload is accompanied by improved myocardial efficiency.[9] Digitalis seems to have an important primary action on venous tone, causing the venous pressure to fall; a very significant part of the improvement of cardiac function from digitalis results from this effect on the venous pressure. The British Postgraduate Medical School investigators found no evidence of any immediate beneficial effect on cardiac output from rate control in auricular fibrillation.

Still another use for the cardiac catheter has been indicated [13] in the study of interatrial septal defects. The admixture of arterial with venous blood in the right auricle can be demonstrated directly, and the whole interesting hæmodynamics of this and other forms of congenital heart disease may be worked out. FLETCHER [14] has also shown how the technique may be applied to the study of pericardial tamponade. He has demonstrated that the rise in venous pressure in this condition is in the first instance a compensating mechanism to maintain an effective filling pressure of the heart against the external pressure exerted by the pericardial effusion.

The potentialities of this method have not yet been fully developed; its judicious use by physiologically minded clinicians will cast a flood of new light on many obscure aspects of cardiovascular disease, and it may well find a place in the assessment of prognosis and the control of treatment.

6. Richards, D. W. *Bull. N.Y. Acad. Med.* 1944, **20**, 363.
7. McMichael, J. *Brit. med. Bull.* 1945, **3**, 105.
8. Barcroft, H., Edholm, O. G., McMichael, J., Sharpey-Schafer, E. P. *Lancet*, 1944, **1**, 489.
9. McMichael, J., Sharpey-Schafer, E. P. *Quart. J. Med.* 1944, **13**, 123.
10. Sharpey-Schafer, E. P. *Clin. Sci.* 1944, **5**, 125.
11. Richards, D. W. *Fed. Proc*, 1945, **4**, 215.
12. Edholm, O. G., Howarth, S. M., McMichael, J. *Clin. Sci.* 1945, **5**, 249.
13. Brannon, E. S., Weens, H. S., Warren, J. V. *Amer. J. med. Sci.* 1945, **210**, 480.
14. Fletcher, C. M. *Brit. Heart J.* 1945, **7**, 143.

The Second Reading

THE National Health Service Bill will not receive its second reading until immediately after Parliament returns from the Easter recess on April 30. The Conservative Opposition will move:

"That this House while wishing to establish a comprehensive health service declines to give a second reading to a Bill which prejudices the patient's right to an independent family doctor; which retards the development of the hospital services by destroying local ownership and gravely menaces all charitable foundations by diverting to purposes other than those intended by the donors the trust funds of the voluntary hospitals; and which weakens the responsibility of local authorities without planning the health services as a whole."

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Annotations

THE BILL AND THE HOSPITALS

In a letter to the *Times* last Saturday, Sir William Goodenough, chairman of the Nuffield Provincial Hospitals Trust, made out a strong case for giving the management committees of non-teaching hospitals more responsibility than is offered them in the National Health Service Bill. As we said on March 23, there is a real danger that regional control may leave so few important decisions to be made by the management committees that competent people will not want to give their time to local hospital affairs. Sir William Goodenough points out that each of these committees is going to be concerned with the administration of a hospital or group of hospitals comparable in size to a teaching hospital. "The committee's task will be a very responsible one. It will be the body in the closest contact with patients and in the best position to judge local needs and to know local circumstances and difficulties. It must, therefore, have as its members as able persons as are appointed to regional boards." To secure them he would give the local management committee a status approximating much more closely to that of the board of governors of a teaching hospital; "it should be a body corporate and have certain of the powers which, in the Bill, are given to regional boards." In particular, it should be enabled (1) to accept gifts or legacies; (2) to sue or be sued in its own name; (3) to receive from the regional board, and spend at its own discretion, a share of the endowment income; and (4) to appoint the hospital officers, except that consultants and specialists would be chosen jointly with the regional board. The committee should receive from the regional board an annual budget and have freedom of expenditure within the total of this budget. In general Sir William Goodenough hoped that under the Bill "spending bodies . . . will not be required to adhere rigidly to approved and very detailed estimates."

Speaking to the Institute of Hospital Administrators the same afternoon Mr Aneurin Bevan, Minister of Health, said he was anxious to avoid "conscription of the balance-sheet," and if the proposals of the Bill were sympathetically and imaginatively examined he thought they would be found to go far towards meeting this difficulty. The teaching hospitals and the regional boards would receive from the Ministry global sums for their annual budgets. They would be free to spend this money as they liked and would not need to seek the approval of the Ministry for any particular item. In the same way the regional boards had power, if they wished, to allocate block grants to local hospital management committees, and he hoped they would do so. The Chancellor of the Exchequer, Mr. Bevan promised, would not be allowed to lay a finger on a single penny of hospital endowments. The teaching hospitals would retain their own endowments and the regional boards would get allocations from the pooled fund; and these sums were to be, as it were, extra pocket-money for them. The teaching hospitals would also still be eligible for grants from the University Grants Committee, and, like the regional boards, could still receive fresh endowments. Mr. Bevan's audience of hospital administrators seemed a little sceptical whether these last would materialise, but he assured them that he did not believe that when the object of pity became the care of the State the impulse of pity would disappear.

The first opportunity for Parliamentary debate on the Minister's proposals is given by the motion which Lord Moran, P.R.C.P., has tabled in the House of Lords, drawing attention to the white-paper and resolving "that this House, while regretting any measures which might impair the efficiency of the general practitioner's service, welcomes proposals for the better coördination of the hospitals services of the country."

THE TOURNIQUET

THE tourniquet has been decried in recent years as causing more damage than it is worth, and the tendency has been to advise direct pressure on the bleeding-point. Hinman,[1] discussing its rational use, points out that when a limb has been hopelessly damaged and is bleeding severely, a permanent tourniquet may be applied as near as possible to the wound, without worrying about crushing the tissues; in such injuries it serves the further purpose of diminishing shock and forestalling the crush syndrome.

With the more common injuries, and for routine operations, it is important that a temporary tourniquet should be kept at a tension not grossly above that of the artery to be occluded. Since it is difficult to estimate tension with the rubber tube or the Esmarch bandage, Hinman favours the pneumatic cuff connected to a sphygmomanometer. It is not necessary, as is often done, to inflate this to a pressure of around 250 mm. Hg; 10–20 mm. above the systolic pressure is enough. But the systolic pressure during operation may reach a peak 40 mm. above the resting preoperative level, so a satisfactory standard level for the pressure in the cuff is the preoperative level plus 70 mm.; higher pressures only increase local tissue damage. The elective use of the inflatable tourniquet to secure a bloodless field in orthopædic operations has also been discussed by Lucas and Dick.[2] This is usually the responsibility of the anæsthetist. They have found that cuffs of varying sizes are conveniently made from the inner tubes of cycle, motor-cycle, or car tyres, and that the widest possible cuff should always be used. A good deal of work has now been done on the refrigeration of limbs distal to the tourniquet, to delay the onset of gangrene or infection, in conditions such as severe crush injuries where immediate surgical attention is not possible, and the method is of particular value before amputations in elderly diabetic and arteriosclerotic patients. No anæsthetic is needed, for the chilled tissues are insensitive.

The possible ill-effects of a tourniquet are well known and numerous. Gangrene is rare, and the constriction may be maintained for several hours provided it is released regularly every 30–45 minutes. Nerves are damaged by the local pressure, not by distal ischæmia; the radial and peroneal suffer most readily, so a cuff should never be applied in the region of the elbow or knee. The ordinary Esmarch bandage applied to the thigh for the removal of a semilunar cartilage may easily endanger the sciatic nerve unless it is applied as near the buttock as possible. Fortunately such palsies usually recover completely in 2–3 months. Tourniquets may also cause skin lesions resembling second-degree burns.

Though the application of a tourniquet to a damaged limb prevents the features of shock or of the crush syndrome while it is in place, these will appear when it is removed and the toxic factors enter the circulation, unless the limb is first amputated. What is more, the tourniquet, by promoting local constriction and distal ischæmia, is liable to give rise to the crush syndrome, in the same way, if not to the same degree, as pinning under a beam. This is exemplified at the end of long orthopædic operations, when the blood-pressure falls and the general condition deteriorates after the tourniquet is removed and the patient has returned to the ward. Though this effect can be minimised by frequent releases of the pressure during operation, most surgeons prefer to finish as quickly as possible, without having their field obscured by blood.

1. Hinman, F. *Surg., Gynec. Obstet.* (*Int. Abstr. Surg.* 1945, 81, 357).
2. Lucas, B. G. B., Dick, I. A. G. L. *Lancet* 1944, ii, 243.

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ABILITY AND THE EXAMINATION SYSTEM

THE Education Act of 1944 lays down as a fundamental principle that every child shall be entitled to the form of education which his age, ability, and aptitude demand—an ideal which presupposes the existence of an efficient and comprehensive system of assessing a child's potentialities. Under the Act,[1] children at the age of 11 years pass from the primary to the secondary stage of education, and some form of test must be applied to assess their suitability for either a grammar school, which is intended for children with scholastic ability, a technical school for those with particular aptitudes, or a modern school for those destined for a less specialised career. Although provision is made for the transfer, when necessary, of older children from one type of school to another, 11 years must remain a critical age, for the child's future and the realisation of the parents' hopes and ambitions depend on the decision then made. Since entrance tests based on a single examination may often be fallacious, careful thought must be given to the classification and selection of pupils for admission to secondary schools, and the London County Education Committee[2] is to be congratulated on its breadth of vision in designing a system capable of progressive adjustment as the new educational system becomes established.

At the time when children had just returned from evacuation, London teachers knew little of their pupils, and a continuation of a modified type of written examination was therefore inevitable, though it was realised that the written test, in its modern form, affords evidence mainly of a child's general intelligence, and yields little information of his special aptitudes. As a result of recent changes, less emphasis is now being placed on written tests, which have ceased to be strictly competitive and serve only to group the candidates into broad categories. Ultimately a child's school record card should provide a summary of both his abilities and aptitudes, and with this object in view a special form of card is now being devised. In several years' time, when school records have become available, it may be possible entirely to replace the formal written test. Until then great importance is being attached to the head teachers' reports on each child. In these, intelligence is found to carry the most weight, although consideration is given to special aptitudes, which are estimated by observation, and to other factors, such as the suitability of the child for the atmosphere and curriculum of the grammar school, and the willingness of the parent to allow the child to remain at school beyond the age of compulsory attendance. Of other methods of testing children under consideration, formal oral tests are thought to be difficult to apply on account of the magnitude of the task, the need for maintaining a uniform standard, and the large number of interviewing panels required. Interviews are regarded as an unreliable method of assessing candidates, to be used only when doubts arise out of evidence collected from other sources.

When it comes to the assessment of special aptitudes the L.C.C. committee is concerned not only with how the information is collected from the child but also with the nature of the attributes being assessed. The question then arises whether the estimate of the head teacher, which is based on observation, should be supplemented by special tests. In the general view of psychologists, few special aptitudes reveal themselves clearly in a child of 11, and there seems to be little justification in attempting to test for aptitude in the individual subjects studied at the various types of secondary school, for at this age the child's knowledge of these subjects is rudimentary. The possibility remains that psychological tests can be devised whereby latent aptitudes may be discovered before they have had an opportunity of developing. Research on such tests is making great progress, but psychological methods of this nature have not yet reached the stage where they can be recommended for general use in schools. With older children the detection of special aptitudes is easier, and at the age of 13 the final decision on admission to technical and art schools is often made from specimens of the pupils' own craft work.

As the new system develops, in some areas it may be possible to organise comprehensive schools covering the three types of secondary education, while in other areas secondary schools may be grouped into multilateral units, each providing a full range of the various types of curriculum. Such a system would make better provision for the special requirements of each child, and where a special ability or aptitude is developed at a relatively late age the change from one form of education to another would present few difficulties. The most troublesome problems will continue to arise in the borderline cases which are refused admission to grammar schools; here, although misjudgments may be rectified later, the loss of time may place the child at a disadvantage in the pursuit of a scholastic training.

As an entrance qualification, potentiality, whether latent or apparent, is now superseding the child's past attainment of knowledge. Few will bewail the eclipse of a system by which children of 9 or 10 years were gathered into scholarship classes, crammed with knowledge, and sometimes spurred on by anxious and ambitious parents to the point of mental exhaustion.

1. See *Lancet*, 1945, 1, 823.
2. London County Education Committee. Report of Higher Education Subcommittee, Jan. 29, 1946.

AN ARMY INSTITUTE OF PATHOLOGY

THE U.S. Army does not believe in half-measures. One example of its generous and farsighted provision for medical affairs is to be found in the Army Institute of Pathology, which is shortly to have a new building better suited to its expanding functions. The institute examines all important histological specimens, which are forwarded by air-mail from all theatres. About 4000 "cases"—half of them surgical and half post-mortem—are received each month. Distance does not involve serious delay, since reports are sent back by radio-telegram. This arrangement ensures a high and uniform standard of histological reporting, a comprehensive central collection of tissues, and ready access to reports on individual patients—a point of some importance with a shifting population like an army. Already this valuable collection has provided material for exact studies on the morbid anatomy of diseases of special importance to the soldier, including scrub-typhus and other rickettsial diseases, trench foot, fat-embolism, epidemic hepatitis, gynæcomastia, brain lesions following extractions of teeth, coronary disease, heat-stroke, teratomas of the mediastinum, and odontogenic tumours. The work is assisted by civilian pathologists who serve as consultants. There is a close and profitable association between the Army Institute of Pathology and the National Research Council's American Registry of Pathology, which is housed in the same building. Records and material are thus brought together for systematic study and for the general use of students and medical men who wish access to them. At the moment about 18,000 enucleated eyes (including 2000 with malignant melanoma) and 5000 tumours of the urinary bladder are on hand for investigation.

Teaching is also an important function of the institute. Within the last year over 1000 sets of illustrative slides, some on specialised subjects, have been sent out to army medical units. Medical schools of the United States and Canada have been supplied with tissues from cases of tropical diseases and the institute also furnishes lantern-

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slides and outlines for clinical-pathological conferences. Other activities include a medical illustration service and a museum and medical arts service which receives from its constituent units an average of 5000 photographs a month as well as film records. It is not surprising to learn that the Army Medical Museum, which is open to the general public, has 200,000 visitors each year. Needless to say, this venture is supported by an ample establishment: "the professional staff consists of more than twenty officers who have been selected on the basis of specialised knowledge. Technical and clerical aid is rendered by a detachment of 30 enlisted men and W.A.C.s and 62 Civil Service employees." During the war a generous American army pathologist said to an officer of the R.A.M.C. "I wish I could team up your boys with our equipment." We hope that the medical services of the post-war British Army will not rest too heavily on the remarkable work that good men have done with minimum equipment, and that pathology, which is the basis of good clinical practice, will be given scope and means in proportion to the proved abilities of its exponents.

A PIONEER REPRINTED

Ebenezer Howard's *Garden Cities of Tomorrow*, which has had so great an influence on town and country planning in many countries, first appeared in 1898 and has now been republished.[1] It deserves closer study than is always accorded it by specialists, for many recent developments have been based, at least theoretically, on Howard's prevision. A sharp distinction must be drawn, however, between the modern view of what is called a "satellite town" and Howard's garden city. Nor has the sprawling development of Suburbia any connexion with the community centres which he advocated, the best example of which is Letchworth. Howard was only directly associated with this and its immediate successor, Welwyn Garden City, but the numerous garden associations abroad are a result of his inspiration. Today, the confusion left by the war, the destruction of so much that was beautiful in countryside and town, the overcrowding of suburban areas, the horrors of ribbon development—all cry out for better town and country planning. Howard's visionary but practical mind pointed the way, and no time could be more appropriate for a new edition of his book. If his basic idea goes back to More's *Utopia*, his was the first practical step in the realisation of community life, work, and play.

PERFORATION OF THE RECTUM BY ENEMA NOZZLES

MINOR abrasions and tears of the rectal mucosa by the nozzles of enema syringes are probably common and pass unnoticed. Ordinary sensation in the rectum ends at the dentate margin; proximal to that point the innervation is sympathetic or autonomic, and considerable mutilation of the rectal wall may therefore take place without the patient being aware of it. These minor injuries heal without difficulty. Pratt and Jackman,[2] of the Mayo Clinic, have collected 20 reported cases of more serious injury and have added 2 more from their own experience. When actual perforation of the bowel occurs, the course of the case depends on whether or not the peritoneum is penetrated. Up to now about half the patients with peritoneal injury have died, but early surgical intervention and the use of sulphonamide drugs should reduce the mortality. In two types of patient the rectum seems to be particularly vulnerable: the patient over fifty-five years of age, and the pregnant woman at term. The perforation is most likely to occur with the patient in the sitting posture. One of the patients treated at the Mayo Clinic, having inserted the nozzle "far into the bowel," had tried to evacuate the enema fluid with the nozzle still in situ. The second patient was given a high colonic lavage, and felt sudden acute pain as the solution was running in. Pratt and Jackman suggest that enema nozzles should always be fitted with a flange large enough to prevent their insertion for more than 2 inches. When a nozzle is passed well beyond the sphincters, with the patient sitting down, it meets the anterior wall of the rectum. Depending on its direction, it can pierce the wall either intra- or extra-peritoneally. If fluid is then injected through the advancing nozzle, the patient will feel sudden severe low abdominal pain. Bleeding per rectum is not an invariable symptom and the perforation may be overlooked until peritonitis or cellulitis has supervened.

Because of the relative absence of pain and the importance of early diagnosis, Pratt and Jackman are convinced of the value of proctoscopic examination as soon as there is reason to suspect rectal injury. The danger of causing further soiling of the peritoneum is, in their opinion, far outweighed by the help given to the surgeon in accuracy of diagnosis. When the site of the perforation is seen, a catheter is passed into the hole and left there for the guidance of the surgeon at laparotomy. A few grammes of sulphathiazole crystals can be insufflated into the hole before the catheter is passed. Operation consists in identifying the hole in the bowel and repairing the defect. Sulphathiazole 10–15 g. is then left in the abdominal cavity. If operation has been really early it may be safe to close without drainage. In late cases, in which repair of an inflamed bowel may present difficulty, a temporary colostomy may be a wise precaution.

REALISM IN FIRST-AID TEACHING

DURING the war many first-aid students profited by the ingenious and convincing wounds and injuries staged by the Surrey County Rescue School at Leatherhead under the spirited guidance of Mr. Eric Claxton. Peace has her injuries no less severe than war's, and Mr. Claxton and his fellow enthusiasts have decided that they still have a useful function to fulfil in the training of first-aiders. They have therefore formed a Casualties Union, with Mr. W. Rowley Bristow, F.R.C.S., as president and Mr. Claxton as hon. organiser, and have now published the first issue of the *Casualties Union Journal*,[1] containing articles by Dr. J. E. Haine and Mr. L. S. Michaelis, and giving accounts of faked injuries and the methods by which realism is achieved. It is clear that the union is a lively body, bent both on investigation into the best ways of simulating injuries and situations for teaching purposes, and also on experiment with new methods of extricating casualties from awkward places. It is anxious at the same time to put the results at the disposal of all who can profit from them. Already 21 union branches have been established—15 in Surrey, 5 in other counties, and 1 in Holland—for the benefit of rescue and first-aid personnel, police, fire services, and others. The promoters feel that the union could also do good work for the Merchant Navy, in industry, and in schools. The aim is to provide a nation-wide service which will rescue first-aid teaching from the sterile repetition of the little handbooks, and give those who study it more than an inkling of what they may encounter.

1. With a preface by F. J. Osborn. London: Faber. Pp. 168. 6s.
2. Pratt, J. H., Jackman, R. J. *Proc. Mayo Clin.* 1945, **20**, 277.

1. Winter 1945–46. Obtainable from the hon. secretary, Casualties Union, The Bend, Send, Surrey. 1s. 6d. per copy.

THE INDEX and title-page to Vol. II, 1945, which was completed with THE LANCET of Dec. 29, will be published with the issue of April 27. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

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Special Articles

THE BILL

ATTITUDE OF THE B.M.A.

THE great hall of the British Medical Association in Tavistock Square was filled to overflowing on April 4 when the metropolitan counties branch had invited all doctors in their area to hear an address by Dr. CHARLES HILL, secretary of the association, on the Profession and the Bill.

He began by summarising the Government's proposals, which he said had hardly been changed at all in response to the comments made on them by the Negotiating Committee. The Bill therefore was not the result of negotiation with the profession; it was the Minister's own Bill, and he seemed to want to hurry it through its second reading before the doctors, the voluntary hospitals, and the local authorities had time to consider it properly and apprise the public of its effects. There was, of course, good in it: the profession approved of the marriage of the two hospital systems, voluntary and municipal, and of their regional development in natural hospital areas. But need the Minister own all the hospitals? Some said that provided the doctor enjoys the right atmosphere, apparatus, and ancillary help it does not matter who owns the institution in which he works. Others, including the B.M.A. council, thought that without physical ownership the Minister could exercise enough control through the power of his purse. If a hospital was to attain its rightful place in the community it should be locally owned.

Under the Bill consultants would work, whole-time or part-time, in an establishment owned by the State. Those who did not want to see medicine become a technical branch of local and central government must judge the Bill accordingly. The profession was wholly opposed to proposals which would directly or indirectly, sooner or later, lead to its entering a salaried State service. It was not in the public interest that the loyalty of the family doctor should be divided between his patient and a public body: there was a danger that he might come to prefer the approbation of superior officers and committees.

COMPENSATION AND REMUNERATION

The proposals for compensation for practices, Dr. Hill continued, might not be generous but they could not be called unreasonable. As for remuneration, there were no grounds for thinking that the recommendations of the Spens Committee would be unsatisfactory; indeed they might do what had long been needed—set a new standard not only for practitioners but indirectly also for other doctors, such as those in public health. The profession, however, must learn to examine proposals of this kind in relation to principle and not according to the amount of compensation or remuneration offered. "Is there something important to our freedom in the custom of buying and selling practices? Is the ownership of goodwill important to the professional freedom of the practitioner?" The majority opinion, Dr. Hill thought, was that it was not necessary to abolish buying and selling in order to secure a better distribution of doctors.

A lot of nonsense had been talked about maldistribution. Bournemouth was often cited as an over-doctored area; but the Central Medical War Committee had discovered that this was a place where appearances were deceptive, taking no account of the high average age and medical reasons that had led men to choose it for their work.

Admittedly it was not strictly correct to describe as "direction" or "negative direction" the power of control the Government was demanding; nevertheless doctors wishing to enter an area would have to get the permission of a Government committee. Was it right that a man who had satisfied the General Medical Council should be dependent on the decision of a (predominantly medical) committee appointed by the Minister before he could settle in practice? It was possible that he might go from area to area seeking work yet never finding it. Also the position of women might become difficult. True, the sale of practices could be abolished without interfering with the movements of doctors; but was it likely that the present Government were spending £66 million and allowing laissez-faire methods of distribution?

SALARIES AND HEALTH CENTRES

The basic salary for practitioners mentioned in the white-paper (but not in the Bill) is in Dr. Hill's opinion a stepping-stone to a salaried service. Such a service must create an employer-employee relationship between those who pay and those who are paid. Further it must interfere with free choice of doctor; for it was impossible to contemplate men on equal basic salaries doing unequal work, and they would have to share patients equally. He agreed, however, that there might be special circumstances or areas in which a guaranteed minimum income—even in the form of a basic salary—might be appropriate, as in the Highlands and Islands of Scotland.

It was a pity that the health centre had become the focus of so much controversy. This means of organising medical practice had both advantages and disadvantages, but it was not yet established that treatment by committees was better than treatment by individuals, and the proper form and function of health centres should be the subject of widespread experiment. There was a very real danger that such centres, with marble halls and bigger and better queues, might degenerate into out-patient departments at their worst. What would be useful immediately was not the communal surgery which was apparently in the Government's mind but a diagnostic centre putting such aids as radiology and pathology at the practitioner's disposal.

It would take time to group practitioners in health centres, and meanwhile the Government, by abolishing the goodwill of practices, was striking at the group practice which at present exists in the form of partnerships.

WHAT CAN WE DO?

After criticising the division of administrative functions under the Bill, in which a departmentalised and fragmentary system was put forward in the guise of a comprehensive service, Dr. Hill turned to the question "What can we do as a profession?" The first thing needed was to clear our minds—to define our criticisms and formulate our constructive proposals. The next thing would be to ensure that the necessary amendments are moved in the House of Commons. Were such amendments likely to succeed? Were the Government likely to be deterred by the opposition of doctors to sections of the Bill? No. Nevertheless the fact remained that no Government could bring into being any health service unless they had the coöperation of the profession. "It is not my business to threaten," said Dr. Hill: "it is to state a fact." What had to be done was to explain to the public that though doctors shared the aim of the Bill, which contained good as well as bad, they wanted both the public and the profession to remain free. The starting-point of the Government's proposals was Beveridge's Assumption B, that a National Health Service was desirable (1) to improve the health of the people and (2) to achieve closer control of certification. The public should be brought to understand why the doctor who signs a certificate should be free from the control of those who administer insurance benefits.

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The question whether or not the profession should enter the service should be deferred until the Bill was seen in its final form. Meanwhile the important task was to influence the public. Never, said Dr. Hill, had the profession stood in greater need of leadership and unity: "the B.M.A. will provide the leadership; the unity must come from the ranks of the profession." If unity was absent, the responsibility would, when the time came, be placed fairly and squarely where it belonged.

Asked what doctors should do if the Act proved unacceptable, Dr. Hill said he thought the profession was not yet in a position to bind itself on what it would do. Every doctor was however being given the opportunity of saying over a 6*d.* stamp what he would be prepared to do. "If you mean business; if you want to be in a position (should the profession so decide) to carry this fight to a conclusion; then send your guarantees"—as soon and as generously as possible. For effective action to be possible the profession would have to achieve far more unity than exists today. The success of the guarantee fund would afford a fairly good indication of the profession's attitude, but the decision whether or not to participate in the service would be taken, when the Act was passed, on current opinion—on the conclusions of each individual doctor on the scheme in black and white before him.

PROBLEMS OF CHILDBEARING

AN INQUIRY NEXT MONTH

THE need to obtain detailed information on social and economic aspects of childbearing is urgent for two reasons. First, the health services are being remodelled, and if the environmental background is neglected the new maternity services will only incompletely fulfil the functions for which they are designed. Secondly, it is well known that Britain is facing a crisis in her population, and there are reasons for thinking that the medical and other costs associated with the birth of a baby may be a serious deterrent to parenthood, not for the lower-income groups only, but for all sections of the community. There is an excellent case for reducing the financial burden of childbearing, but we have very little idea of how great this is, how it varies between different economic groups, or what proportion of the total expenditure goes on medical fees, payments for extra domestic help, and the cost of clothing, and other articles for the baby. It is clear that knowledge on these points is essential if any attempt is to be made to remove the financial deterrents to parenthood.

With such considerations in mind, the Population Investigation Committee and the Royal College of Obstetricians and Gynæcologists have formed a joint committee to inquire into the adequacy of the maternity services and into the social and economic aspects of childbearing. It was realised that to obtain information, more especially on the social and economic side, a personal approach to the mothers themselves was necessary, and a questionary inquiry has therefore been planned which is scheduled to take place in May. If successfully completed, this survey will provide information, unobtainable from any existing source, which will enable the joint committee to make informed suggestions as to the ways in which it is possible to help mothers with the social and economic problems that they meet in bearing children. This inquiry has the support and approval of the Royal Commission on Population, to whom the results would be of great value. It has been made possible by a grant from the Nuffield Foundation.

If the results of the inquiry are to be generally applicable, the information must be derived from a population of mothers which gives a miniature yet undistorted picture of all women in Britain now bearing children. The joint committee propose to take for their sample all mothers throughout the country who have borne a child between March 3 and March 9 inclusive. These mothers will be interviewed eight weeks after the birth of their baby—i.e., in the first week of May. This sample will be large enough to satisfy statistical requirements, and at the same time mothers of all groups will be represented in proportion as they contribute to the births of the nation.

Maternity and child-welfare authorities throughout the country have been asked to coöperate in this inquiry by permitting their health visitors to undertake these interviews. They have given a magnificent response to this request, and 96% of replies received so far have been in the affirmative. Clearly the inquiry is of the greatest importance, and deserves the wholehearted support of the local authorities in whose hands its success or failure will lie.

Medicine and the Law

The Doctor's Legal Duty to Disclose

WHATEVER the requirements of professional etiquette, the law-courts insist that they can require a medical practitioner to give evidence of matters which become known to him in the course of his confidential relationship with a patient. The judicial view was reaffirmed at Birmingham assizes on April 1 by Mr. Justice Lewis in a divorce case.

After the proceedings in a divorce petition had been begun at the instance of the husband, the wife asked a practitioner who had charge of a venereal-disease clinic to state the nature of her illness. He answered that the disease was secondary syphilis but refused further information which her advisers regarded as vital to her defence. Six questions were then addressed to him; they were signed by both the petitioner and the respondent and were approved by the solicitors on both sides. The practitioner declined to answer the questionnaire but said that, if served with a subpœna, he would give evidence in court. The questions, according to the judge, if answered in one way, would have assured the success of the petition; if answered the other way, they would have meant its defeat. The doctor duly gave evidence; he answered all questions in court, and the judge was careful to say that there was no suggestion against his good faith.

Mr. Justice Lewis emphasised that it was of the greatest importance that proper secrecy be preserved in connexion with venereal-disease clinics and that nothing should be done to diminish their efficiency or to impair the confidential relationship between doctor and patient. These considerations, however, did not justify a doctor in refusing to divulge confidential information to a patient or to any named person when asked by the patient to do so. In this and similar cases the doctor would not be guilty of any breach of confidence in giving the information. These views, added the judge, had the approval of Lord Merriman, the president of the Probate, Divorce, and Admiralty Division.

There is nothing new in these judicial observations. The courts, which have always excused barristers and solicitors from divulging what they know of their clients' affairs, have never conceded any similar privilege to clergymen who obtain information through confessions or in other ways; the decision in Normanshaw *v.* Normanshaw in 1893 is one of many authorities to this effect. Nor do they allow privilege to the medical practitioner; in the well-known case of R. *v.* Gibbons in 1823, where a girl was indicted for murder of her illegitimate child and a surgeon was called to testify to a confession she had made to him, his objection was overruled; "that," said Mr. Justice Park, "is no sufficient reason to prevent a disclosure for the purposes of justice." Difficulties of a special kind were foreseen and discussed when venereal-disease clinics were first established, and it may sometimes be necessary to state that the standard of professional ethics may not coincide with the requirements of the witness-box. But it has always been clear that the privilege is not the privilege of the medical practitioner but the privilege of the patient. If, as was apparently the case at Birmingham, the patient desires to waive the privilege, the practitioner is to that extent released from his obligation.

ROYAL MEDICAL BENEVOLENT FUND.—The committee of management, meeting on March 27, with Sir Arnold Lawson, the president, in the chair, again discussed the project for a residential club or hostel which could accommodate a dozen elderly or infirm women beneficiaries of the Fund who are at present living in unsuitable circumstances. The acquisition of an appropriate house is now being considered.

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Reconstruction

HOSPITALS

FURTHER REGIONAL SURVEYS

REPORTS on the hospital services of Scotland, Wales, Northern Ireland, and most of England have already been reviewed in these columns. At the request of the Departments of Health surveys were made in sixteen areas, and we have summarised the findings in thirteen of these.[1] Two more are considered below, and the series will be complete when the report on the North East is published.

The South West

This survey[2] covers an area with a population of 2,645,980, in 5 counties (Gloucester, Somerset, Wiltshire, Devon, and Cornwall), 5 county boroughs (Bristol, Gloucester, Bath, Exeter, and Plymouth), and 162 lesser local-government units. The university and medical school of the region is that of Bristol; at Exeter there is a university college, but as yet no medical school. Under the headings of voluntary and municipal general and special hospitals, maternity homes, isolation hospitals, sanatoria, public-assistance institutions, and convalescent homes the surveyors list 264 establishments concerned with the treatment of the sick.

The general survey notes defects and deficiencies which are fairly general in other areas. Of these we may mention small sites, overestimates of bed complements by allowing insufficient bed-space, inadequate case-notes, non-retention of chronic cases in voluntary hospitals (with consequent exasperation in municipal hospitals), midwifery sometimes conducted in unsuitable buildings, consultants too few in number and too concentrated in location, limited pathological services, and long waiting in outpatient departments. None of the sanatoria in the region have "first-class accommodation." Of the 35 isolation hospitals, only one allows 12 feet between bed centres, making the apparent 1 bed to 1400 population a deceptively fallacious figure; only five can be described as well built, well arranged, and well equipped; and only three have more than one hundred beds. Of the 12 smallpox hospitals, that at Bristol is described as a good unit, six others being fit for occasional use. The public-assistance institutions provide the bulk of the 4752 beds for the aged and chronic sick, but the majority were built over a hundred years ago; they were not planned as hospitals and further adaptation is undesirable. A better classification of their patients into appropriate groups with separate accommodation is also necessary. Although these buildings are now functionally so out of date and although only 16% of their nurses are trained in general nursing and/or midwifery, the surveyors comment specially on the "impressive evidence of sympathy and solicitude" for patients: one proof of this is the infrequency of bed-sores among patients, of whom half are bedridden and a quarter doubly incontinent.

Among the essentials for the future are ready availability of beds and services, ordered partnership of municipal and voluntary hospitals, and the planning of services over a wide area. All specialists should ultimately be engaged only in consultant work, but in the interim the services of consultants with the necessary qualifications who are also general practitioners will be needed. The definition suggested is that a "consultant should be a member of the visiting staff of a large general or special hospital who is recognised by his professional colleagues as a specialist in general medicine or surgery, or in some branch of these sciences, whether or not he is also engaged in general practice," and it is pointed out that in appropriate cases this definition includes medical officers engaged in whole-time local-authority service. Such consultants should work in selected hospitals and pay regular visits to district and local hospitals. A system of hospital inspection by medical and lay inspectors is desirable, supplemented by regional consultant advisers who should carry on in peace-time the work of the consultant advisers of the Emergency Medical Service. The Bristol medical school should be intimately associated with the training and distribution of consultants, questions about a medical school at Exeter or Plymouth being left for future decision.

GENERAL RECOMMENDATIONS

To be capable of providing all the appropriate services, a general hospital needs 400 beds, and a teaching hospital not less than 600, as well as access to other hospitals. Four grades are recommended:

(*a*) The *regional hospital centre*, "the clinical capital of the service," which would undertake medical and nursing training, plastic and thoracic surgery, neurosurgery, and radiotherapy, house a medical statistical office, a medical library and a bureau of medical information, and make consultants available anywhere in the region, as well as undertake all the work also carried out in

(*b*) *Area hospitals*, equipped to treat all general cases;

(*c*) *District hospitals*, smaller than the foregoing, with three or four indigenous consultants, supplemented as required from the staffs of the area hospitals and perhaps themselves holding also appointments there; and

(*d*) *Local hospitals*, in effect the present cottage hospitals, staffed by general practitioners. Here would be treated cases whose home conditions were unsatisfactory for the purpose, and postoperative cases transferred from the area and district hospitals. They would also have facilities for emergency surgery and blood-transfusion, though not for routine major surgery, would have dressing-rooms for minor casualties, and would be regularly visited by specialists from the area and district hospitals.

Area hospitals, besides having all the ordinary medical and surgical departments of a large general hospital, should also have departments, specially housed, for orthopædics, long-stay chronic cases, maternity, infectious diseases, and pulmonary tuberculosis; this pattern of organisation should apply even when the buildings for these special purposes are not close to the area hospital.

The surveyors make valuable suggestions for some of these special services. *Sanatoria* of up to 250 beds allow the medical superintendent to have a personal knowledge of every patient, provide work for up to three resident medical officers, justify up-to-date equipment, and permit the treatment of advanced as well as early cases. There will have to be close links with the public-health department if proper attention is to be paid to the welfare, living conditions, nutrition, and employment of the patient and his dependants. Special hospitals for *children* are justifiable only at the area level; otherwise children should be taken at all general hospitals, with a generous supply of cubicle wards and more beds for rheumatic carditis. *Maternity* accommodation is needed possibly for two-thirds of all births, although by the criterion of abnormality provision for 10% of births would be enough. The scheme of the Royal College of Obstetricians and Gynæcologists is favoured, with the primary maternity centre at the regional hospital centre, divisional maternity centres at area hospitals, divisional sub-centres at district hospitals, and local centres at local hospitals. Sixteen beds is the smallest economic maternity unit.

The *chronic sick* need better medical and nursing provision, improved accommodation—in due course—and proper classification. This includes (*a*) those needing medical or surgical treatment in a general hospital, (*b*) those requiring prolonged treatment, mainly physiotherapeutic, and (*c*) those requiring general medical and nursing attention. General hospitals should participate in the care of these cases. Special provision is also required for the blind, deaf, epileptic, and uncertified non-senile mental cases. *Chronic rheumatism* needs a regional scheme with research at the regional hospital centre, hospitals for long-stay cases, and peripheral clinics, staffed by specialists, for diagnosis and follow-up. The Royal National Hospital for Rheumatic Diseases at Bath is suggested as a special regional treatment centre. *Infectious diseases* need more cubicle accommodation and closer relations—physical and personal—with general medicine, with the bacteriological services, and with public-health epidemiologists.

1. London, *Lancet*, 1945, i, 600; South Wales, Eastern area, Berks, Bucks and Oxfordshire, and Northern Ireland, 1945, ii, 504; North Western area, Sheffield and East Midlands, and Yorkshire, 1945, ii, 681; and five Scottish areas, April 6, p. 510.
2. Hospital Services of the South-Western Area. By V. Zachary Cope, M.S., M.D., F.R.C.S., W. J. Gill, M.D., F.R.C.S.E., Arthur Griffiths, O.B.E., and G. C. Kelly, B.SC., M.D., D.P.H. H.M. Stationery Office. Pp. 208. 10s.

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The *pathological services* should be coördinated on a regional basis, with the university at the hub, into one comprehensive service. Both the regional centre and the area hospitals will need departments of morbid anatomy, bacteriology, and chemical pathology, each under a medical director. The service should extend to the district hospitals, which would have branch laboratories, and the local hospitals, involving regular or occasional visits by the pathologists. This development would be assisted, and teaching and research work stimulated, by the development of an institute of pathology in Bristol. General practitioners should be able to send specimens direct to the laboratories, and in so far as large local authorities continue to need their own pathological services the organisation should be on parallel lines.

An efficient *radiological service* would involve radiologists reporting on all films, but by no means necessarily involves X-ray apparatus at all local hospitals. Radiotherapy and *anæsthetics* both require regional organisation, with specialists, in the main, functioning at area hospitals.

The *outpatient department* is rightly described as "equally important, complementary to, and inseparable from, the inpatient department." Not only are consultative clinics needed at area and district hospitals, but consultants should regularly visit the outpatient centres at local hospitals, which, apart from this use, might function as health centres.[3] The appointments system for outpatients is supported, and also the establishment of hostels in connexion with the outpatient departments of area and district hospitals, for the convenience both of patients coming from country districts and of the relatives of patients who are dangerously ill.

A regional blood-transfusion service; the employment of specially trained dietitians; the supply of *all* food needed by patients (instead of partial dependence on relatives, which still obtains in some localities); improved hospital dental services; and admission bureaux on an area and district basis are among other recommendations. At the admission bureaux records would be kept, ambulance transport arranged, and discharge reports forwarded to practitioners.

DETAILS

The surveyors recommend that their area should be treated as a single region. The central hospital must be in Bristol; if need be, there must be branches of its special departments in certain area hospitals, but this is preferable to a second central hospital in Plymouth or Exeter. Area hospitals would be situated in Bristol, Bath, Exeter, Plymouth, Gloucester-Cheltenham, and West Cornwall. These area hospitals would be the centres with which hospitals in the surrounding districts would be linked. Beds to the number of 9·4 per 1000 population are needed, made up of 4·6 acute, 0·5 maternity, 1·0 tuberculosis, 0·73 isolation, and 2·5 chronic. Ignoring qualitative deficiencies, the shortages at present, for the whole region, amount to 3168 acute, 579 maternity, 941 tuberculosis, 40 isolation, and 2060 chronic beds.

The *Bristol Area* has a population of 810,694. District hospitals, involving enlargements and new building, will be situated at Weston-super-Mare, Taunton, and Yeovil, each being partially self-supporting in consultants and partially dependent on Bristol. In that city, a considered case is presented for a new area general hospital of 800 beds, to contain, in addition to the usual facilities, departments of radiotherapy, plastic surgery, neurosurgery, and thoracic surgery. On the same site, which would need to extend to several hundred acres, there should be developed as circumstances permit 100-bed maternity, 200-bed children's, and 200-bed aged-and-chronic hospitals, and possibly a sanatorium of 200 beds. An eye hospital of 100 beds would also be desirable. The municipal hospital at Southmead should be considerably enlarged, a new district hospital should be established in East Bristol, and various closures and alterations would accompany these changes.

Provision for infectious diseases should ultimately centre on Bristol and Taunton. Tuberculosis will require three sanatoria, each of 200 beds, and a children's sanatorium for the whole region. Suitable units for maternity are also indicated.

The *North Gloucestershire Area* has a population of 312,000. The local scheme for a new area hospital, sited between Gloucester and Cheltenham, is supported, being partly necessitated by the unsatisfactory nature of existing hospital buildings; but these can nevertheless go on serving as satisfactory local hospitals, as outpatient centres, and for the reception and treatment of casualties. The usual recommendations are made for special hospitals to be grouped round the area hospital. No district hospitals are needed in this particular area, seven local hospitals sufficing.

The *Bath Area* covers a population of 436,000 in Bath, north-east Somerset, and a large part of Wiltshire. The area hospital should be developed on an extended Combe Park site, which already houses four hospitals, including the Royal United. Additional units—particularly for maternity, children, and chronic sick—are required. The district hospitals of this area, ultimately in new buildings, would be at Swindon and Salisbury, eleven local hospitals completing the necessary general provision. None of the infirmaries in the eight institutions in which the chronic sick are treated gets by, and all must ultimately be closed. In a long-term policy, infectious-diseases accommodation will be concentrated in Bath, Swindon, and Salisbury.

The *Exeter and North Devon Area* (population 471,069) will have the Royal Devon and Exeter Hospital, in due course suitably re-sited, with 700 beds and the appropriate satellite special units, as its area hospital. The district hospitals will be at Torquay and Barnstaple, and will need for all purposes 640 and 440 beds respectively. Sixteen local hospitals, four of them with maternity beds, will also be needed.

The *Plymouth Area* (population 340,000) needs a hospital centre which will entail a fusion (already achieved at the consultant-staff level) on the physical plane of the Prince of Wales's Hospital (the principal voluntary) and the City General Hospital. In this way could be developed a real area general hospital, with maternity, pulmonary tuberculosis, orthopædic, and chronic units. No district hospitals are needed for this area, the number of local hospitals required being four.

The *West Cornwall Area* has a population of 244,000. Geographical considerations dictate a separate area here, independent of Plymouth. The area hospital should ultimately come from a fusion of the Royal Cornwall Infirmary (Truro) and the Camborne-Redruth Miners and General Hospital, and development, with associated special hospitals on a site near Truro. District hospitals would be at Penzance and St. Austell, and nine local hospitals, including that of the Isles of Scilly, are needed.

West Midlands

This important area[4] contains, in organic relationship with one another, five counties (Staffordshire, Warwickshire, Worcestershire, Shropshire, and Herefordshire) and ten county boroughs (Birmingham, Coventry, Dudley, Worcester, Burton, Smethwick, Stoke, Walsall, West Bromwich, and Wolverhampton), the population amounting to almost 4 million. Included in the survey also are the county and county borough of Northampton (population 318,000), whose links with the other areas are more tenuous.

The surveyors deal first with matters of principle. General hospitals, they say, should serve a population big enough to justify their having a good resident medical staff. Special departments for obstetrics, and eyes and ears, should normally be part and parcel of them. Where possible they should be part of a hospital centre with infectious and other units in close proximity. Buildings of the semipermanent pavilion type, grouped round the common medical and administrative departments on an ample site, are best; but not many existing hospitals can be made to comply with these criteria. Ideally, three different buildings are needed: (1) a central outpatient and casualty department in an easily accessible central district, (2) the main acute hospital on the outskirts of the town, and (3) a recovery hospital in the country. Transport services for relatives must be good and cheap and ambulance services for the patient pooled and centralised under a bureau providing also, if need be, a bed-finding service.

3. The surveyors do not make themselves entirely clear on this point, but as they later recommend many local hospitals with inpatient departments, we have substituted "function" for their word "become." Beds at health centres are of course by no means impossible.

4. Hospital Services of the West Midlands Area. By John B. Hunter, M.C., M.CH., F.R.C.S., R. Veitch Clark, B.SC., M.B., D.P.H., and Sir Ernest Hart. H.M. Stationery Office. Pp. 122. 5s.

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In the light of recent events, the discussion on coöperation between municipal and voluntary hospitals may be only of historic interest, but the report does note evidence of its increasing frequency. Cottage hospitals are favoured, subject to proper availability of consultants and the absence of expensive specialised equipment, as places where general practitioners can continue the care of patients where home circumstances are unfavourable. The minimum requirements for the chronic sick also receive much attention. The wastage of staff and of money in the existing system of small isolation hospitals should be obviated by substituting large units as parts of general hospitals, a third of the accommodation being in cubicle wards and the main wards housing only 12–16 beds. The treatment of pulmonary tuberculosis demands units of not less than 200 beds, X-ray plant, facilities for occupational therapy, workshops, and resident medical staff. No general hospital can be efficient without properly equipped pathology and X-ray departments. The rarer specialties, such as thoracic and plastic surgery and radiotherapy, have to be organised on a regional basis with the key units situated in the university hospitals centre.

From the standpoint of organisation, the natural hospital district is the town, with the surrounding area of country to which it supplies many services. In the West Midlands, such districts fall, with only marginal exceptions, within geographical county boundaries. These districts the surveyors then review, county by county, enumerating and describing first the existing hospital resources in each district and then their suggestions for the future service.

Birmingham, with a population of a million, forms a natural hospital district of itself, but is in addition the university hospitals centre for the whole region. It has some 8500 beds, of which a quarter are in voluntary and three-quarters in municipal hospitals. The distribution of work between the two types is not uninteresting. The voluntary hospitals have half the acute medical and surgical beds, all the eye beds, the majority of the gynæcological, ear, nose, and throat, orthopædic, traumatic surgery, and radiotherapy beds, and the only special children's and skin hospitals. The municipal have the other half of the acute medical and surgical beds, most of those for maternity and sick children, and virtually all for chronic, infectious, tuberculous, and psychiatric patients. Up to a quarter of the beds in the voluntary hospitals are occupied, on the average, by non-Birmingham residents. Coördination is actively pursued through the medium of the Birmingham Hospitals Council, which examines all plans for hospital extension. A feature which must be unique, at least in scale, is the Birmingham Bed Bureau, maintained by the St. John Ambulance Brigade, which maintains a unified ambulance service for the city and arranges emergency hospital admissions to the average number of 150 weekly.

A new municipal hospital in the north of the city (planned before the war), the completion of the new Queen Elizabeth Hospital, which will be the central feature of the Birmingham Hospitals Centre, and which now has 582 beds in use, to its full quota of 720, and various other extensions of general hospitals are recommended. The two additional municipal maternity homes, each of 100 beds, already planned, should be built as quickly as circumstances allow, and in addition to an extension of the Children's Hospital each general hospital should have a pædiatric department. The Nerve, Ear and Throat, and Eye Hospitals should move ultimately to the Hospitals Centre, which should also have additional gynæcological beds. Pulmonary tuberculosis could best be dealt with also in one unit, instead of the present four.

Warwickshire (population about 600,000) falls naturally into five hospital areas, the largest being Coventry, where both the voluntary and municipal hospitals are so war-damaged as to need rebuilding, preferably on fresh sites. The quarter of a million people to be served will still need two general hospitals; but common medical staffing, a common preliminary training school for nurses, and a common admission centre and outpatient department should have serious consideration. Rugby, Nuneaton, and Warwick-Leamington are other natural areas, the fifth being the residential fringe east of Birmingham. Detailed suggestions on integration, enlargement, and replacement of existing resources are made.

Worcestershire would supply the hospital needs of its 400,000 residents through hospital districts based on Worcester, Bromsgrove, Kidderminster, and Stourbridge.

Staffordshire falls into three divisions: (*a*) North (460,000), of which Stoke, with more than half the population, is the natural centre; (*b*) Mid Stafford (280,000), with district hospitals at Burton and Stafford; and (*c*) South (800,000), with district hospitals centred on Wolverhampton (with Coventry and Stoke, second only to Birmingham in future specialist resources, and a possible centre for postgraduate teaching), Walsall, West Bromwich, and Dudley.

Shropshire (241,000) in its marginal areas has links with Liverpool, Manchester, and Chester rather than Birmingham; but on the other hand Shrewsbury, the district hospital centre, should also serve parts of Montgomeryshire and ultimately acquire one new hospital to replace the existing three.

Herefordshire, a small county with 130,000 population, has, like other areas, problems of coördination—the treatment of which has become unexpectedly radical in nature. Hereford is the natural centre, and Birmingham, although 63 miles away, the nearest and most appropriate university centre.

Northamptonshire (population to be served 350,000) can best look to Northampton as its hospital centre, although Kettering, with its good hospital and its situation in the industrial belt, has claims deserving of a second glance. This county is situated betwixt and between, and for that reason rather than any other was included in this particular survey. Most patients needing treatment in a major medical centre have hitherto gone to London, but that centre is already overloaded. The railway communications with Birmingham are good, but Northampton has never looked that way for its metropolis. Oxford is the nearest university town and subject to an improvement in the transport service should act as the university town and medical centre for this county.

Health Centres of Today

V. FULHAM

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THE maternity home and clinic at Parson's Green, Fulham, is only in a restricted sense a health centre; but since it deals with one form of work that may be undertaken at other centres, features in its design and operation may be of general interest.

The building was opened in 1937. Its purpose was to replace two separate and outmoded buildings which served as a maternity home and clinic; it was designed to aid continuity of treatment between clinic and home; it has also enabled pupil midwives to gain simultaneous experience of antenatal and maternity work. Three other clinics operate in the borough.

The building is set back from the road, opposite open ground. It is surrounded by trees and shrubs, and a large area at the back is used as a kitchen garden. The frontage is narrow, and the site forms a narrow rectangle; to conform with this, the building was constructed in three blocks, connected on each floor by a corridor. There are three floors and a flat roof, which is used by patients.

From the vestibule at the clinic entrance, one door leads to a pram shelter at the side of the building, and another opens into a general waiting-hall. The hall is large and well lit, and patients have expressed a preference for this spacious single room to the multiple small rooms which elsewhere serve one doctor or department. It is equipped with a radio loudspeaker, and a small drinking-fountain for children; a voluntarily run canteen, suspended during the war, used to be popular. The hall is also used for cookery demonstrations, keep-fit classes, and educational films. At one end (near the entrance) is the dispensary and shop where baby foods are sold. At the other are two examination rooms; the four cubicles in each room have proved insufficient, and an attempt is made to avoid two simultaneous antenatal clinics so that the cubicles in both rooms can be used by those attending one doctor. At the back of each room is a medical officer's room, and between them is a common entrance for doctors.

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A door from the hall leads along the main corridor to the back of the building. All departments of the clinic—antenatal, postnatal, infant-welfare, dental, and heliotherapy—and the antenatal and isolation wards are housed on the ground floor. The dental and heliotherapy departments share an entrance, and the dental surgery, which has two recovery rooms, has a separate exit. As far as possible, all women are treated with ultraviolet light in the last two months of pregnancy.

The equivalent of 1½ full-time medical officers are employed at the clinic. In 1945, attendances at the infant-welfare clinic numbered 15,759, at the antenatal clinic 9782, and at the postnatal clinic 330. This is a considerable overall increase on the figures for 1938, which were 11,970, 4432, and 468 respectively. Attendances at the heliotherapy department, which is run by a specially trained nurse and a clerical assistant, in 1945 were 15,012 (compared with 11,752 in 1938); and at the dental department, where two sessions a week are held, they were 2919 (against 1116 in 1938). The equivalent of 3 full-time health visitors work in connexion with the clinic.

The home, which has a separate entrance, staircase, and lift, is connected by a swing-door with the clinic. Patients admitted to the home are divested of their clothes and bathed in the reception department on the ground floor; when discharged, they come down to this department to change again, so that no patient's clothes ever reach the home proper. The first floor is devoted to labour and maternity wards, which include small two-bed wards; patients ask with surprising frequency to be transferred from these small rooms to one of the large wards. Above each bed is a single board which incorporates light, radio switch, plug for electrical appliances, and attention signal. The patients' lavatories and bathrooms are in a separate suite; this arrangement, which is appreciated by the patients, has much to commend it. The many built-in cupboards have been found to save a great deal of cleaning.

In 1938 admissions totalled 526, and in 1945, 492, the decrease being due to the conversion of space for five antenatal beds and the isolation unit on the ground floor to a first-aid post, and it is hoped that this section will soon be restored to normal use.

The top floor is occupied mainly by staff; the front block contains independent flats for the matron and two doctors; the middle block accommodates the nursing staff; and the rear block the domestic staff and kitchen, which serves the wards by an electric food lift and an electrically heated trolley. There is a separate refuse lift.

Water is heated entirely by electricity so that no labour attention is required; separate units feed the running hot-water system and the radiators, whose temperature is controlled by a variostat which is governed by the outdoor dry-bulb reading. Electricity is used at night, when it is cheaper, and the water is kept hot through the day in insulated tanks.

The success of this venture is proved by women who could attend other borough clinics within easy reach of their houses choosing to travel 1½ miles to Parson's Green. Such popularity is not attained without a proficient staff; but it seems fair to assume that the design of the building has favourably affected both patients and staff. Patients, when pressed for an explanation of their preference for this centre, say that its air of spaciousness and modernity appeals to them; this is associated in their minds with a feeling that they obtain here what is newest and best in medicine; and many patients in the higher income-levels now elect to attend the clinic and home. Only one drawback has been encountered: the noise made by children playing in the yard tends to disturb patients and night staff. But this is no great item when balanced against the positive achievements of the enterprise.

Towards Social Security

"As may be Prescribed . . ."

WHEN a modern Act of Parliament reaches the statute book, when the tumult and the shouting dies, a long process begins of formulating and adjusting those instruments of law collectively known as "regulations."

A century ago a piece of law having statutory force would contain within itself almost all the provisions required for its operation. Only such matters as dates of commencement and forms to be employed were left to be "prescribed." Nowadays, however, the tendency—inevitable from the greater output of legislation—is to state general principles in the governing enactment and leave quite important subjects to be determined by the Minister concerned. An Act may require him to consult certain representative bodies, but the final decision is his own. The power of Parliamentary interference is limited to the power of annulling the regulations altogether; Parliament cannot amend them.

Those who defend the system of government by regulations point to the speed and flexibility it achieves. There is no limit to the quantity of regulations that can be turned out by a particular Minister on a particular day, while amendments to them can be as frequent and elaborate as may be desired. With an Act, on the other hand, the process of legislation is so slow and involved that many an awkward provision is left to operate because of the sheer inability to find the time to amend it. At the worst, a regulation can always be annulled.

Critics, on the other hand, aver that the House of Commons has often faced a real dilemma when objecting to a particular clause in a document otherwise satisfactory. Considerable inconvenience may be caused if a complete regulation is rescinded because of objections to one part of it, and the legislator has to strike a nice balance in deciding whether the issue at stake justifies the consequences.

The real safeguard to the community, however, lies in the Minister and his chief officers consulting knowledgeable and interested parties outside his department. It is in these consultations that the detailed wording of regulations can be scrutinised and the final form of the document receives a sufficient measure of support.

The National Insurance Bill now before Parliament contains an interesting requirement that before any regulations are made, and even before a draft is laid before Parliament, the Minister shall submit to the National Insurance Advisory Committee a "preliminary draft." Interested persons may then lodge notice of objection, which the committee must consider in making its report. The Minister is bound to publish a statement showing what amendments, if any, he makes to the draft regulations after considering the report of the committee, and—most significant—giving the reasons for which any recommendation has been rejected.

In the National Health Service other provisions are made for consulting interested parties not merely on regulations but on day-to-day administration. It is, however, provided by clause 69 that regulations relating to the superannuation of officers and to their transfer and compensation shall not be made until a draft has been approved by resolutions of each of the Houses of Parliament. This is known as "the affirmative resolution" procedure. Other regulations have to be laid before Parliament immediately they are made: they come into force on the appropriate date, but either House can annul them within 40 days of laying. (This period does not, of course, include time when Parliament is not sitting.) This is called the "negative procedure."

It is natural for the free mind to resent the limitations imposed by the written word. But, as Sir Cecil Carr has pointed out, even the games of cricket, golf, and bridge do not flourish without some acquaintance with the rules laid down by the Marylebone Cricket Club, the Royal and Ancient Society, and the Portland Club.

Insurance practitioners have their own experience of the medical benefit regulations and the amendments made to them. Some people, though not themselves lawyers, have the quality of mind which goes to the making of a good lawyer. To them the hunt for the correct paragraph and the weighing of words to arrive

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at a correct interpretation has something of the zest of a pastime. Unfortunately, as with a crossword puzzle, it is sometimes possible to arrive at alternative solutions. The zeal of the draftsman to avoid ambiguity sometimes leads him to clothe his thoughts in language which conceals what he intends. Sir Benjamin Cohen, a senior referee chosen by the National Health Insurance Joint Committee, said in a letter to the *Times*, on Sept. 25, 1936:

> "My colleagues and I decide about 50 appeals weekly during the legal year, and I have no hesitation in saying that out of each 50 in at least six cases we were compelled to refuse pensions which would undoubtedly have been earned if the applicants had not been misinformed as to their position by the agents of their approved societies. It is impossible to blame the agents, who are not highly trained officials, for not understanding Regulations which are so framed that a trained lawyer cannot interpret them with any degree of certainty, and the applicant has no redress."

Let us hope that new men in a new age will reach a higher standard. JUSTINIAN.

Public Health

Tuberculosis in Eire

ANXIETY about the care of the tuberculous in Eire is growing, not without reason. The death-rate per 100,000 population from all types of the disease was 130 in 1944, and hospital beds for those affected are too few for the needs of the country. True the death-rate has fallen since the beginning of the century—in 1904 it was 288 per 100,000—but the decline has not been as rapid in Ireland as in some other countries. A white-paper just published by the department of local government and public health [1] attributes this slowness of progress to social factors, habits of life, nutritional causes, poverty, and overcrowding, but especially to failure to segregate infective cases. In 1930–31 the insurance committees which had been set up by the National Health Insurance Act of 1911 were abolished, and sanatorium benefit for insured persons ceased; as a result many patients are unable to accept sanatorium treatment because they have no means to maintain their families while they are away. Annual State grants are given to local authorities, to provide schemes for the prevention and treatment of tuberculosis, and the Hospitals Trust Fund has given £540,000 to provide beds for tuberculous patients. Most counties maintain local sanatoriums, used largely for advanced cases; some of these have been equipped with X-rays in recent years, and in some of them medical officers carry out artificial pneumothorax and other modern methods. Many counties contribute to the maintenance of patients receiving treatment in voluntary institutions. Allowances of eggs and milk are made to needy patients treated at home, and a domiciliary nursing service is provided.

The government feel, however, that the time has come to reorganise the service fully. In 1945 the Tuberculosis (Establishment of Sanatoria) Act was passed, under which beds are to be provided on a scale suited to the needs of different areas. Three new sanatoriums are to be built: one of 1000 beds to serve Dublin city and county; one of 700 beds in Cork to serve the counties and county boroughs of Cork, Limerick, and Waterford, and the counties of Clare, Kerry, and Tipperary; and one of 400 beds in Galway to serve the counties of Galway, Mayo, Roscommon, Sligo, Leitrim, and Donegal. The cost is estimated at about £2 million. Beds are to be available in these sanatoriums for all types of case, including primary infections; and a special section will be reserved for the treatment, in separate units, of children with primary tuberculosis and those with other kinds of lesion. Facilities will be provided for minor chest surgery, radiography, physiotherapy, and eye, ear, nose, and throat treatment. Apart from these regional sanatoriums, some existing institutions are to be enlarged, and others closed, while in some places new small sanatoriums are to be built. In appointing new county medical officers, the candidates' experience in tuberculosis is to be taken into account, and a refresher course for tuberculosis officers has already been held.

1. Stationery Office, Dublin. Pp. 19. 6*d*.

It is interesting to note that the Irish General Nursing Council has taken the step, so far avoided in this country, of instituting a separate roll of tuberculosis nurses. It will be useful to know how this experiment turns out.

Another original measure enables local authorities to make a grant towards the construction of an extra room in a house where a patient with pulmonary tuberculosis is receiving treatment, and where it is impossible to segregate him owing to lack of space. Clearly this could only be done in selected cases, but it might prove a useful way of easing overcrowding in this country too, and is worth bearing in mind.

New equipment has been ordered for the sanatoriums, including fluoroscopes and new types of pneumothorax apparatus. A mass-radiography unit is soon to begin work in Dublin. Dispensary treatment is to be improved and extended to include artificial pneumothorax refills. Legislation allowing the payment of maintenance grants to dependants is likely soon to be passed, and the Minister will probably also receive powers to improve notification of the disease: at present only cases deemed to be infective are notifiable. It is evident that Eire, though lagging behind modern standards in many ways, is making a determined effort to check the ravages of a disease which has always been severe among the Irish people.

Smallpox

All the members of the Southend-on-Sea household in which a girl of 20 died of smallpox on March 28 and the mother later developed a mild attack are now affected. The father was taken ill on April 3, the girl's brother on the 4th, and a lady of 69 who lived with the family on the 5th. The family belong to the sect known as the Peculiar People, who are averse to vaccination, but the father, the mother, and the friend were vaccinated in infancy, and the brother was vaccinated on April 2.

There have been two further cases at New Ferry, Cheshire—the man whose wife developed smallpox after admission to Clatterbridge General Hospital on March 25, and her brother. Strict isolation of the medical and lay staff and patients of the hospital has been applied, and all have been vaccinated.

The troopship *Orion* had a suspected case on board, in a chief petty officer of the Royal Navy, when she docked at Liverpool on April 7.

Infectious Disease in England and Wales

WEEK ENDED MARCH 30

Notifications.—Infectious disease: smallpox, 2 (1 at Bebington, 1 at Southend-on-Sea); scarlet fever, 1393; whooping-cough, 2092; diphtheria, 478; paratyphoid, 4; typhoid, 8; measles (excluding rubella), 2282; pneumonia (primary or influenzal), 1079; cerebro-spinal fever, 74; poliomyelitis, 6; polio-encephalitis, 0; encephalitis lethargica, 0; dysentery, 356; puerperal pyrexia, 156; ophthalmia neonatorum, 67. No case of cholera or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on March 27 was 1161. During the previous week the following cases were admitted: scarlet fever, 50; diphtheria, 37; measles, 91; whooping-cough, 31.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 3 (0) from measles, 8 (1) from whooping-cough, 3 (0) from diphtheria, 66 (10) from diarrhœa and enteritis under two years, and 50 (7) from influenza.

Liverpool reported 12 deaths from diarrhœa and enteritis.

The number of stillbirths notified during the week was 232 (corresponding to a rate of 27 per thousand total births), including 22 in London.

THE National Association for the Prevention of Tuberculosis is arranging for a research fellow, with the help of a technical assistant, to conduct a twelve months' medicosocial survey on the Gold Coast.

Sir Alfred Webb-Johnson, P.R.C.S., has accepted the presidency of the Association of Certified Blind Masseurs. Dr. William Moodie has been appointed general consulting psychologist to the National Institute for the Blind. Dr. Moodie is senior physician in charge of the department of psychological medicine at University College Hospital.

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In England Now

A Running Commentary by Peripatetic Correspondents

WHEN I went into hospital for my operation I was noted for my fine footman's calves. Three weeks later, sound in wind and limb, and retaining the majestic portliness appropriate to middle age, I found I was legged like a whippet. My gastrocnemii sagged like gutted fish, my peronii were grooved like an old man's hand, and my tibialis antici had left the scene entirely, so that my shin-bones ran in a straight line to my bossed and gnarled patellæ. Now what can have caused this rapid and severe wasting but complete immobility of the legs caused by the weight of the bedclothes? Any patient who goes to bed for more than two or three days should be nursed with a cradle over the feet. Since feet are easily chilled, the cradle should be lined with an electrically heated blanket, the switch being placed within reach of the patient's hand.

Other details in our traditional nursing methods struck me as due for revision. For example, the proper way to change the sheets on a bed with the patient in it entails rolling him first on one side then on the other; but if he has a seam down the middle of his tum, he doesn't really care for it. He prefers an unorthodox plan by which he raises his own behind, using his back muscles, while the sheet is quickly drawn under him. Again, some nurses are cunning at arranging pillows to support the back, while others are less successful. But why should not every bed have a back rest with arms—a white-wood frame with a cane back, which could be scrubbed? Two or three pillows would then serve the purpose better than six or seven do at present.

Twice every day two nurses seized my mattress and pulled it, with my ample weight upon it, two or three inches towards the head of the bed; twice a day it worked down to the foot again. What about an anchoring device, to save some thousands of pounds of nurse-power daily? In the early days I too was lifted, when I had worked down, by nurse-power. What about a rope tied to the foot of the bed and fitted with a cross-bar on which the patient could haul, like the device in maternity wards by which a mother is helped to bear down? Or a ring on a chain above every bed, as found in spinal wards and, they tell me, in Guy's Hospital? Mattresses are valuable, and to protect them a mackintosh is spread under the bottom sheet; it is hard and hot to sit on, and must certainly favour bedsores in the thin. What about some other device—a layer of absorbent but porous material of some kind—perhaps a thin blanket of sphagnum moss—which would protect the patient from discomfort and the mattress from anything but major disasters?

It seemed to me that our nursing methods, though on the whole good, very well carried out, and pleasant to experience, were extravagant in the use of nurses, and not fully adjusted to the welfare of the patient. Too often they are taught because they have always been taught, and not because they are the best that could be devised. I believe we need a school of experimental nursing, dedicated to the task of discovering better ways of doing things; such a school would help to give nursing the new impetus which it so badly needs.

* * *

We are at sea now in our floating whale factory, off the South Orkneys. A blizzard is sweeping over the great expanse of the "plan-deck" on which are the carcases of two 80-foot blue whales in various stages of dismemberment. Great strips of blubber lie around, with here a mound of steaming gutments, there a mountain of dark meat. Three great saws are making short work of the jaws, vertebral column, &c. The deck is slippery with blood, oil, and excrement, and tatters of flesh and offal lie in every direction. Over all this comes stepping delicately my fair-haired "hospital attendant," aged 15½, bringing dinners on a tray for a compound fracture of the leg, a very severe scald of both legs and thighs, and a concussion-query-fractured-base. My skill—or otherwise—in bed-making, draw-sheets, bedpans, feeding, wiping, &c., has lately been put to a severe test, and to give 'Pentothal' and apply plaster to an open fracture simultaneously is not very amusing. Our first whale, brought to us, the factory ship, by one of our attendant "catchers," caused great excitement, and the clicking of cameras almost drowned the sharpening of the flencers' knives. Now we have become blasé, and the magnificent creatures—fin, blue, or sperm—may lie on deck and never get a glance from anyone but their dissectors, whose technique is gross, but exceedingly rapid and accurate. So indiscriminating is leviathan's disintegration that so far I have not even recognised a pancreas, much less a suprarenal. But professional duties have prevented long attendance on the plan-deck. Later I may do better and perhaps win a 6-inch fœtus. My great ambition is to satisfy the curiosity of a certain professor, whose parting request, as he pressed a supply of penicillin on me, was: "Do try and find out whether whales eat their after-births."

* * *

I am getting very concerned about the steady deterioration in the spirit of good will that is coming over the hospital world just now. It seems pretty clear that the present boards of management will go. To my mind they have carried out their manifold duties and heavy responsibilities in the main with a single-minded purpose both in municipal and voluntary hospitals. In the latter particularly there have been many laymen who felt that hospital work was just one of those things which they could do without being involved in party politics.

It looks as though we shall have to face up to some decisions at the board of management of my hospital this coming week. There appear to be three points of view in the hospitals generally:

(1) The magnanimous, generous attitude—a desire to leave everything for the new authority to take over in as good shape as we can. Perhaps this is not without an ulterior motive on the part of some members of the staff who hope that such an attitude will count for virtue with the new authority.

(2) The obstinate attitude born of a spirit of dull hopelessness—that the only thing left now is to keep the engine ticking over until the new driver comes to occupy the seat.

(3) The vindictive attitude which is determined to spend every asset and leave the new authority with as much trouble as possible.

I doubt if there is much of the last, but there is some of the second, and it will be very difficult for the remaining two years to maintain anything like a magnanimous spirit in defeat.

* * *

Lancectomy? Poor. Lancectomy is the operation of removing THE LANCET from its cover, throwing away THE LANCET (or sending it to the pathologist), and keeping the cover. A few crazy doctors might do this, but not your average reader. Lancotomy—i.e., just cutting it and leaving it at that—is better, and probably has quite a following. Lancostomy, the operation of cutting it open and leaving it open and perhaps even reading some of it, should be the editorial aim. I have found the operation quite easy. Using a fairly sharp knife (no need to lubricate with margarine) I make a midline longitudinal incision and have yet to record an unsuccessful operation. Insecure scars have not worried me, as I do not suture it up again. Those who like to do this would probably prefer the transverse incisions now becoming fashionable. But now, I see, it is all to be made easy for us; just when I had got the technique perfected, too.

* * *

He was dressed in sober black, "Eden" hat included, the very embodiment of professional respectability, when I saw him driving his small black coupé past our maternity hospital—and on the left side of his windscreen was pasted: "PIANOFORTE TUNER." My wife and I have been collecting unofficial windscreen legends of the "Doctor" variety, and so far I lead with my tuner, though her "Radio Repairer" runs him a close second. Surely now that the war has been over for nearly a year, and the danger of German invasion is fairly remote, it is time that we decided whether to remove these windscreen advertisements altogether and content ourselves with our plates (professional brass or chromium), or to pay the armorial-bearings tax and inscribe our style and title on the car door under the quaint little sign of our calling. If this hint is not taken, I shall consider having printed some "Chad" cartoons—*Wot! No brass plate?*—and surreptitiously sticking one on the reverse of every "Doctor" label I can get at.

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Parliament

ON THE FLOOR OF THE HOUSE

THE high light of the week in party politics was the two days spent on the committee stage of the Bill to repeal the Trade Disputes Act of 1927. The Conservatives were sure they were right to fight it line by line and the Labour Party were equally sure they were right to drive it through mercilessly by the use of the closure in an all-night sitting followed by a normal day's sitting as an addendum. To the outsider these lengthy sittings may seem irrational, but they do provide stern tests, and in the atmosphere of emotional strain and the actuality of physical strain, if not exhaustion, a good deal of truth, and of good debating, comes out.

The two-day storm was followed by a business-like and sober debate on the Naval Estimates which finished yb 9 P.M., and on the following day we reached the economic high light of the week in the debate on the food situation. Mr. Attlee described the world problem with quiet lucidity, and Mr. R. S. Hudson, the former Coalition Minister for Agriculture, slam-banged into the Government in best party style. It almost seemed as if he thought that the dislocation of world agriculture caused by war and droughts was all the fault of the Labour Party. But Sir John Orr affirmed that any Government in office at the present time, after the cessation of Lend Lease and in face of post-war confusion, would have had a difficult time. He looked towards the future and the conference of the Food and Agriculture Organisation of the United Nations which is to begin in Washington on May 20.

Sir Ben Smith had a not too difficult task in replying to Mr. Hudson, but the debate was not primarily one of politics and personalities but of the human importance of vigorous action to deal with the menace of world food shortage, and in some places of famine. Indeed the debate is best seen in the perspective of a House of Commons consideration of British responsibility towards a world problem which was, even as the House debated, being considered by a European Cereals Conference in Church House, Westminster, under the auspices of the United Nations.

MEDICUS, M.P.

FROM THE PRESS GALLERY

The World's Rations

"The plain fact is that millions of people today are faced with a scarcity of food and some with absolute starvation." With these words the Prime Minister opened the debate on the world food shortage on April 4. In this country, he continued, we were not faced with starvation, but as we depended more than any other country on imported foods we were in a difficult position. It was impossible for us by any sacrifice to restore the world situation. It was in the great staple foods, wheat and rice, on which the greater part of the human race depended, that the shortage existed. He doubted whether even if distribution and transport were perfect there would be enough to go round. It was certain that that was not possible in the conditions obtaining today. No one must imagine that this was a short-term problem, and the Government were trying to stimulate cultivation and production, because next year was not going to be easy.

The cereal position was fundamental, but there was also a world shortage of other foods, in particular of fats. The Government had decided not to make a further cut in the fat ration immediately, but to intensify efforts to increase supplies. He was bound to warn the country, however, that he could not guarantee that a further cut would not be necessary. The general food position, he thought, was rather better than a short time ago, but the outlook for next year was not satisfactory. By next June the world would have consumed all the abnormal stocks of wheat accumulated during the war. In this country we would have reduced our stocks to a level below the accepted minimum of peace-time. If world harvests this year fell below the average the outlook would be black.

Few countries had as accurate food statistics as we had, Mr. Attlee declared; no other country had such an efficient system of rationing, such a complete system of administration, or such complete coöperation from the ordinary citizen. Our people felt acutely distressed at the thought of other nations suffering want, and even starvation, while we carried on. But a Government was charged with a responsibility to its own people which it could not shirk, and we had reduced our margin of safety to the limit. The strength of our people must be maintained as a vital factor in the economic, political, and social recovery of the world. He had not agreed to allow the voluntary collection of food to be undertaken for dispatch in parcels abroad. Our people had been rationed for six years on standards which were only just sufficient to keep them in health. Individual gifts, while satisfying the conscience, did not make an effective contribution to the solution of the problem, and the less spectacular course of making everyone place as small a demand as possible in the common pool of food was more realistic. We would do all we could to prevent our late enemies suffering starvation, but if it was inevitable that some should suffer, the claims of the Indian people and the people of the liberated territories must rank higher than those of the Germans and Japanese. The Combined Food Board was an experiment, the essential principle of which the British Government would like to see continued. It was only by such means that large-scale famine had been avoided. This country had been wise in not giving in to those who wished to abandon rationing and price controls at an early stage. If that had been done the present shortages might have caused starvation here. If the international system of allocation had been abandoned there would have been starvation in many countries. The moral was the same internally or internationally: in times of scarcity planning was the only means of providing fair shares for all and of avoiding starvation on the one hand and lavish consumption on the other.

Speaking for the Opposition, Mr. R. S. HUDSON thought that the shortage of wheat was due to unharmonised planning rather than to natural catastrophe. The real remedy was to get the United States to cut down the feeding of grain to animals, and to see that the waste spaces were cultivated. On the Government's own figures they were short of a quarter of their supply of fats for human consumption. It would appear from the Prime Minister's speech that the Government were gambling on being able to find a little more fat somewhere in the world. He had been shocked to hear from a representative of the Ministry of Food (Dr. Edith Summerskill) that a reduction was contemplated in the total supplies of milk. He suggested that more might be done to produce fish, not only for the home market, but also for the Continent.

Dr. HADEN GUEST pointed out that though it was our primary duty to look after our own people it was by no means our only duty; in fact, we could not look after our own people adequately unless in some degree we looked after the whole world. He had seen on the Continent the patchwork arrangement of well-fed farm zones and badly fed urban zones and he suggested that it might be possible, by taking full advantage of the resources of the farm population areas in Germany, to alleviate considerably conditions in the urban and industrial areas. There was need for action based upon an exact scientific appreciation, in the military sense of the word, of the problems which faced each country. The United Nations Organisation should have its own operational staff. We had to get ourselves and the rest of Europe over the dangerous period of the next harvest, and to plan the 1947 harvest so as to avoid a recurrence of the dangers which now threatened us. The first was a defence problem, and we needed the scientists' help in that. The next problem, in 1947, should be a matter of offence, to secure rising standards of production all over Europe.

Sir JOHN ORR, M.D., F.R.S., said he wished neither to attack nor to defend the Government but to express a certain amount of sympathy with those who were concerned with the food position at present. A food shortage was not something to which mankind had been unaccustomed in the past, nor was the maldistribution of food a new problem, and the war had worsened the whole situation. There were two aspects of the problem.

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The first was the temporary crisis which was being dealt with by UNRRA, and the Combined Food Board. Secondly, there was the long-term planning which was necessary to relieve the world for ever from hunger and malnutrition. The two problems were closely related. The work must be maintained until all mankind had food on a health standard. The work of the Food and Agricultural Organisation, which was brought into being last November, was far advanced. With the help of workers borrowed from government departments and other institutions they hoped that by the end of the summer it would be possible for the F.A.O. to submit for the consideration of governments and of the United Nations organisations concerned a food plan to relieve the world of hunger and malnutrition and bring about a rise in the standard of living of primary producers. The F.A.O. was calling a conference which would be held in Washington on May 20. That conference would make an assessment of the food position and of the prospects for 1946–47 and 1947–48. He hoped that agreement would be reached on the measures which could be taken to increase production and to improve the distribution of the available food. The object of the F.A.O. was to raise the levels of nutrition in all countries. It had been agreed that before the war half of the world's population suffered from lack of food, which in its turn was the cause of disease, misery, and premature death. If we could produce the necessary foodstuffs to raise the health standard the pre-war position would be replaced by health, happiness, and longer life, and mankind would escape from many of the social and economic evils which had bedevilled them in the past. Between the two wars, when there was grave malnutrition, a series of measures were taken in this country which besides making agriculture more prosperous had improved out of all recognition the feeding of our people, and cut the infant mortality and other death-rates by half. They proved how easily health and welfare could be attained. The war food policy of this country had been the admiration of the world. He believed that in the present appalling crisis it would be possible to lay the foundations of permanent collaboration among the nations in a plan which would bring about a world food scheme based on human needs and set going a benevolent revolution.

Dr. BARNETT STROSS said that nobody could exaggerate the ill-effects of world starvation, but suggested that the abolition of hunger might well mean the abolition of war. There could be no solution of the problem unless the quantity of food produced before the war throughout the world was doubled. Countries like Britain which had been accustomed to import vast quantities of food must produce more for themselves, and exporting countries must make sure that the food which they exported was a true surplus.

QUESTION TIME

Confidential Discussions

Mr. R. DE LA BÈRE asked the Prime Minister whether, in view of the secrecy imposed on the British Hospitals Association during their recent discussions with the Minister of Health and the misunderstandings which such secrecy engendered, he would give an assurance that the Government would discontinue this practice in connexion with the introduction of further measures of legislation.—Mr. HERBERT MORRISON, Lord President of the Council, replied: In the case mentioned the Minister of Health was not consulting the British Hospitals Association as such, or expecting it to commit itself to any specific proposals. He was consulting a group of individual representatives from the association in order to obtain their personal expert opinion on certain points before the Government's proposals were submitted in the proper manner to Parliament. Such a consultation was naturally confidential, and I see nothing to be deprecated in it. Mr. DE LA BÈRE: Does not the Minister now appreciate how very regrettable it was that these enlightened representatives were both gagged and muzzled, and is he aware that the Government always seek to move the Closure, both in Parliament and with the general public, on all matters of truth?—Mr. MORRISON: That seems to me to be rather a mouthful of irrelevancies. These confidential discussions were started by the previous Conservative Minister of Health. If Parliament is never to permit confidential discussions prior to the introduction of a Bill, the alternative is to bang the Bill down on the table and say to all those interested, "There you are, take it or leave it." I think it is far better to consult people. The hon. member is getting shockingly bureaucratic.

Mr. OLIVER STANLEY: Was not this the procedure which the Minister of Health adopted in this House, and did he not, in fact, gag them by asking them to come and see him, and then paying no attention to them?—Mr. MORRISON: If consultation proceeds on broad policy prior to the introduction of a Bill, it must be confidential. The right hon. gentleman may call it gagging if he likes—that is just Conservative language—but they must be confidential. That is what it amounts to. I am perfectly sure that the right hon. gentleman, in the course of his Ministerial life, has had heaps of consultations of precisely the same type.—Mr. DE LA BÈRE: The matter is thoroughly unsatisfactory.

Medical Service in Rural Areas

Lieut.-Colonel J. H. HARE asked the Minister of Health if he would ensure that every village without a resident doctor should have a visiting doctor who would hold a surgery once a week.—Mr. A. BEVAN replied: A special fund is available from which assistance may be given to insurance doctors practising in isolated rural areas. I have, however, no power of direction in this matter, nor would it in any event be practicable to make such arrangements covering every village.

Demobilisation of Doctors

Sir T. MOORE asked the Minister how many doctors had been released from the Armed Forces from VE-day to date; and how many still remained in the Services.—Mr. BEVAN replied: The number of doctors released since VE-day is: Navy, 1411; R.A.F., 1054 (in both cases to March 15); Army, 5907 (to March 25). The numbers serving at those dates were, respectively, 1229, 1602, and 6371.

Extra Fat for Tuberculous

Dr. HADEN GUEST asked the Minister whether persons suffering from tuberculosis were able to obtain any extra allowance of fat towards meeting their special dietary needs.—Mr. BEVAN replied: I am informed by the Minister of Food that a ration of 2 oz. of cooking fat, as compared with the normal civilian ration of 1 oz., has been made available for persons suffering from tuberculosis whose condition is such as entitles them to the special milk allowance for tuberculous people.

An Underdoctored Area

Mr. EDGAR GRANVILLE asked the Minister of Health if he was aware of the insufficient medical services in Stowmarket; if he was satisfied with the present supply of doctors; and what changes he contemplated in the near future.—Mr. BEVAN replied: The East Suffolk county insurance committee have, I understand, received few complaints from insured persons about the medical service available under the National Health Insurance Acts, but they are considering whether there are any steps they can take to improve the position. As to private patients I have no jurisdiction. I have no doubt, however, that the suggestion that the number of doctors in this area needs to be augmented will be of interest to doctors who are deciding where to practise.

Imported Smallpox Cases

Replying to a question Mr. BEVAN stated that the number of cases of smallpox landed in this country lately, and the reported vaccination history of each, were as follows:

Empress of Australia—1 case. Vaccinated in infancy, and several times while in the Merchant Navy, but with no take.

Duchess of Richmond—4 cases. Vaccinations: (*a*) infancy, 1940—slight take, July, 1945—no take; (*b*) infancy, May, 1941, September, 1941, and September, 1944—no take; (*c*) infancy, July, 1945—no take; (*d*) March, 1942, April, 1943, August, 1945.

Batory—1 very doubtful case. Vaccinated in infancy and frequently during service, lastly in 1945.

Orontes—1 case. Vaccinated in infancy and in January, 1946.

Service personnel from the *Duchess of Richmond* were retained under medical supervision from arrival on March 1 to March 7; and from the *Georgic* from arrival on March 2 to March 4 when it was decided that a suspected case was not a case of smallpox. Three contact cases from the *Empress of Australia* were taken to hospital.

Consumption of Milk

In answer to a question Sir BEN SMITH, the Minister of Food, said that during January, 1946, the estimated quantity of milk sold off farms in England and Wales was 95·5 million gallons; 90·1 million gallons were sold for liquid consumption by domestic consumers and catering establishments and the balance of 5·4 million gallons was manufactured into milk products.

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Letters to the Editor

RELEASE OF R.A.F. DOCTORS

SIR,—I am a R.A.F. medical officer of release group 36. In common with my colleagues, I noted with dismay the acceleration of Army and Navy releases (as compared with the R.A.F.) during the last three months Today I see that the Army releases are to reach group 47 in June, and the Navy group 55 in the same month The R.A.F. have promised to release group 32 by the end of May. I note that Mr. Bevan stated in a Parliamentary reply on March 14 that the question of allocating a larger number of recruits to the R.A.F. was still "under consideration" by the Government (after three months). Mr. Isaacs has stated that he will not arrange the transfer of men (and this includes M.O.s) from the Army to the R.A.F. Yet, during the last six months, approximately a third of my patients have been Army personnel. Surely if I can treat Army patients a member of the R.A.M.C. could treat R.A.F. patients?

Is there nobody who will take up our cause? The C.M.W.C. hides behind the shield of its "advisory capacity only." The B.M.A. appears indifferent. The medical men in positions of power and authority in the R.A.F. are regulars and so "couldn't care less." And we volunteer medical officers are scattered over the face of the earth and are without power, voice, or representation. And meanwhile the Government trades complacently on the fact that our own ethical creed will save them from the embarrassment of a "strike"—as, indeed, it will. But we are men, after all; we have jobs awaiting us that are being jeopardised by the premature release of our Army and Navy colleagues; we have wives and families who try to remain cheerful when they see younger men than ourselves reunited with their homes. And we writhe in the toils of our impotent fury.

I appeal to you, Sir, to take up the cudgels on our behalf. There is no-one else to whom we can turn.

We have had enough of anonymity. I am not ashamed of my name or of my words.

B.A.O.R. PETER S. CHESHIRE.

CONGENITAL DEFECTS FROM RUBELLA

SIR,—Until I read, in the February number of the *British Journal of Ophthalmology*, an abstract of an article by Lang and Danielson on cataract and other congenital defects in children following German measles in the mother, this possible relationship was unknown to me. It was therefore remarkable that during February I saw one such case and obtained notes of another.

My patient was a boy of 9 years whose mother had German measles very slightly about the 6th or 7th week of pregnancy; with it she had a threatened miscarriage. The boy's weight at birth, which was not premature, was 5¾ lb. He was born with an enlarged heart, with some valvular defect, and at 14 days old he was seen by a children's specialist, who thought he would not survive. He is smaller generally than the average child. He has had congenital cataract in both eyes, for which he has been operated on. He also has severe nystagmus and a very bad convergent squint, so that the vision with correction is only 6/60 in each eye. His head is smaller than normal, measuring 19½ inches round, and he is somewhat deaf: his mother was told that there was a nerve deafness of his left ear. This boy is the second of three children; the other two are normal, though the mother had a threatened miscarriage with the third child.

Travelling down to Devon this lady got into conversation with another mother, and discovered that she too had had German measles while she was pregnant, and that her child was abnormal. I have never seen this lady or her boy, who is now aged 3 years, but she has kindly given me details of her case.

She had German measles during the 7th week of pregnancy, but was not unduly upset. The child was born 6 days before full term; it was an instrumental delivery and the child was in an exhausted state; weight 5½ lb. The anterior fontanelle was exceptionally large, extending from the crown of the head to the bridge of the nose, but closed by 2 years. The mother thinks the child's head was very small at birth; it now measures 17 in. At 3 weeks it was discovered that he had some cardiac defect; he has a slight murmur, but it does not embarrass him at all. He is a deaf-mute, but his general health is good and he is strong, active, and very intelligent. He wears glasses, but his mother did not mention his eyes except that there was a slight defect in one of them, perhaps a refractive error.

It does not, of course, follow that the defects in these two cases are necessarily due to the rubella in their mothers, but the connexion is certainly interesting. What with his eyes, his ears, and particularly his heart my patient has always been a delicate child, and a source of constant anxiety, not to say expense.

The mothers of the two boys would do anything they could to help, and would be the first to support the view expressed in your leading article of Feb. 9 that "Here, if ever there was one, is an urgent subject for investigation in this country. At last there is a chance of attacking the incidence of congenital defects at their roots."

Exeter. M. DYKES BOWER.

THE BILL

SIR,—Section 34 (1) of the National Health Service Bill states:

"Subject to the provisions of this Part of this Act relating to the disqualification of practitioners, every medical practitioner engaged in medical practice (otherwise than as a paid assistant) . . . shall be entitled . . . to be included in the list of medical practitioners undertaking to provide general medical services for persons in that area."

At this stage it may be pertinent to ask what is going to happen to the "paid assistants" who outnumber the principals in general practice? During the war many of the assistants were directed into the Armed Forces, and their subsequent careers were made up of directions from one unit to another. Having been demobilised and gone back to practice as an assistant—for it is difficult under present circumstances to buy a practice—must he again be "directed" when the long-awaited Bill comes into law?

London, N.W.6. I. M. SEGAL.

*** Doctors with practices of their own will automatically have their names included on the list of the local executive council, provided they join the service by the appointed day. Other doctors, including assistants, will have their names placed on the list of their chosen area unless the Medical Practices Committee decides that there are already enough general practitioners in that area. If more than one doctor applies for a single vacancy the committee will decide who is to fill it. That is the extent of the "direction" contemplated.—ED. L.

PREPUBERTAL CASTRATES

SIR,—During the past ten years I have been studying a collection of cases of eunuchoidism, and castration before and after puberty. I am lacking, to complete my series, a male prepubertal castrate, the youngest in this series being 16. I should be glad to get in touch with any doctor who has a male patient castrated by accident or surgery before puberty. Records of prepubertal female castrates would also be of great interest to me.

77, Harley Street, London, W.1. S. L. SIMPSON.

ACCURACY OF HÆMOGLOBINOMETRY

SIR,—In your annotation on "Accuracy in Blood-counts" (March 9, p. 353) you say: ". . . any hæmatologist who knows his work will say that" (an accuracy of) "±10% is the best that can be expected from hæmocytometry or hæmoglobinometry." The words in parentheses are ours. The annotation cites evidence to support this statement as far as hæmocytometry is concerned, but not with reference to hæmoglobinometry. Macfarlane [1] has shown that the majority of 60 observers had an error of less than ±10% when they used Haldane's hæmoglobinometer, though the limits of the errors made were 86·4% and 104% of the "true" value as determined by an independent method.

Several sources of error in their method were recognised clearly by Haldane and Smith,[2] and they suggested means by which the errors could be minimised. That

1. Macfarlane, R. G. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1945, no. 252, p. 59.
2. Haldane, J., Smith, J. L. *J. Physiol.* 1899–1900, **25**, 331.

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their advice has been largely unheeded is evident from Macfarlane's publication. He described an experiment in which 56 competent observers took part. Of these, only 5 adopted Haldane's original technique in its entirety. There were six different methods of tint-matching in use by the 56 observers referred to, and, as far as we are aware, the accuracy of five out of the six methods has not been tested by experiment.

We have been interested in the accuracy of the different methods by means of which the tints of solutions of carboxyhæmoglobin, contained in hæmoglobinometer tubes, can be matched. We found one observer with an error of 10% among the 23 observers who were tested. All the others had smaller errors, and one of these observers rarely made a mistake when he matched the tints in daylight. Our experiments show that it is possible to find, for most observers, conditions in which accurate comparisons of tint can be made. In our experience, under optimum conditions, the accuracy which can be achieved with a Haldane hæmoglobinometer approaches that obtained with a good visual colorimeter—namely, 2–3%.

The results of these experiments are in course of publication.

St. Bartholomew's Hospital Medical College. J. L. D'SILVA. E. C. TURTON.

SNAGS ABOUT STREPTOMYCIN

SIR,—The value of streptomycin in human tuberculosis, referred to in your annotation of March 30, unfortunately will not be confirmed or disproved in this country. Up to the present Washington have refused to allow any streptomycin to come out of the country for trial here, in spite of repeated attempts to persuade them to do so. Hinshaw and Feldman (*Proc. Mayo Clin.* 1945, **20**, 313) have already published results of trials in human tuberculosis which are very promising, especially in the fine, widely distributed lesions which are probably of hæmatogenous origin. In spite of this report, however, supplies of streptomycin have been refused on the grounds that it is of no value in human tuberculosis.

Penmaenmawr, Caernarvonshire. R. GRENVILLE-MATHERS.

*** For about a year eleven commercial firms in the U.S.A. have been making streptomycin, but their output is still very small compared with the output of penicillin; the estimated monthly production is 25 kg. or 25,000 million units. About 60% of the streptomycin made is allotted to the U.S. Forces and Public Health Service; the remainder is being used for clinical trials supervised by Dr. C. S. Keefer. Although Rutgers University of New Brunswick holds patents in connexion with the production of streptomycin, there would probably be no obstacle to its manufacture under licence in Great Britain.—ED. L.

EXPERIENCE IN THE FORCES

SIR,—A friend in England, sending me valuable information about prospects in the public-health service, remarked, "but of course you will have to come back to your old hospital job in order to rehabilitate yourself."

I and a large number of British medical officers in India take fairly strong objection to this view, which most medical men seem to hold of their colleagues in the Forces. There is an increasing tendency to adopt the attitude that the doctor in the Forces has suffered considerably in his professional capabilities as a result of his service. In my opinion this is not true; indeed I think the reverse is the case. As a medical officer who has been in charge of a school of hygiene in India, and later in a staff appointment, I have been brought into contact with many medical officers, and have had ample opportunity of estimating their knowledge and their keenness to improve that knowledge by clinical meetings and demonstrations.

The range of a medical officer's experience in this country includes most of the ailments that occur at home and also diseases which we only read about as students. For the first time, the painful reality that malaria is the greatest scourge on earth and that it can be largely prevented is brought to the notice of the home-trained medical officer doing his service in India. Not only with malaria, but with such diseases as bacillary and amœbic dysentery, enteric, cholera, smallpox, diphtheria, typhus, and deficiency diseases the preventive aspects are driven home with a force that can never be equalled in Britain. The result is that the M.O. receives a training and obtains experience in the practice of preventive medicine which his colleague in civilian practice cannot equal. I should go so far as to say that if any rehabilitation is required, our civil medical practitioners would gain considerably from a spell in the tropics. From the curative aspect, we in the Forces were the first to use and try out such discoveries as penicillin, and the newer kinds of sulphonamides, insecticides, and repellants.

The M.O. released from the Forces resents being regarded as in any way inferior as a doctor because of his years in the Army, and there is a good case for the assertion that he is a better man, professionally and intellectually, as a result of his war-time experience.

Kamptee, India Command. L. RICH.

BLOOD-TRANSFUSION IN MAXILLOFACIAL INJURY

SIR,—A great deal was learnt and published during the war about maxillofacial injuries and blood-transfusion; but the particular importance of having a "drip" set up in maxillofacial cases before an emergency develops has not been sufficiently emphasised.

Reactionary and secondary hæmorrhage from jaw injuries is not rare; and, unless a cannula is already in a vein and blood immediately available, so much blood may easily be lost that the patient dies. It is at times extremely difficult to control copious secondary bleeding from jaw injuries; and, unless someone can supervise the drip (or literally pouring in) of blood at one site, while the surgeon attempts to stop it at the fracture site, the patient may die in a few minutes. This was pointed out to me by Lieut.-Colonel John Gordon, O.C. surgical division of an I.B.G.H., and I feel that, when any doubt exists about its being likely to be required, a cannula should be tied in at or before operation.

Patients may be conveniently divided into (1) those with shock seen within a few hours of their injury; (2) exhausted and dehydrated patients, possibly already having had first-aid treatment; and (3) patients in good physical condition but with jaw injuries so severe that secondary hæmorrhage is a real possibility.

(1) Those with shock seen within hours of their injury will need resuscitation in any case. When seen by the maxillofacial surgeon in a forward area, they may have had, or be having, plasma transfusion by needle in the cubital area. If it is thought that transfusion or perfusion should be continued for six hours or more, I think it preferable, even if the needle is working perfectly, to cut down on the saphenous vein above the medial malleolus and tie in a cannula. There is then no danger of a slip out from a vein, it is more comfortable, the patient can move his arms, and one is certain of a patent channel for blood, plasma, or saline.

(2) Exhaustion and dehydration still occurred, owing to: the distance of evacuation, even with the help of aeroplanes; the high temperatures; the reluctance or fear to drink and swallow; and the fact that wounded men are not always plied with fluids. Some days having elapsed, their wounds and jaws may be foul, but early operation is still indicated. A glucose-saline drip is a convenient way to restore body fluid while the patient is unconscious and until his jaws are immobilised, enabling him to swallow without pain. When the patient has been anæsthetised, the surgeon, washed up but not gloved and gowned, can insert the cannula, set the drip going, and then wash up again. Such a drip is kept going in the ward and is a very valuable adjunct to fluids by mouth, apart from its availability for an emergency.

(3) With jaw injuries such that secondary hæmorrhage is very likely, the anæsthetic is a good opportunity for tying in a cannula. Typing can be carried out, blood cross-matched, and the blood, with patient's name on bottle, kept in the refrigerator against possible emergency. It should be borne in mind that in a case of severe secondary hæmorrhage *quarts* of blood may be necessary before control is obtained.

Should a jaw injury be seen and treated within twenty-four hours, it is extremely unlikely that there will be secondary hæmorrhage; so the cannula need only remain in place

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about twenty-four hours. The cases which give rise to anxiety are those which are not seen until four days or more after injury and have not received adequate treatment. In these cases the cannula should remain in place until twelve days after injury, the apparatus being kept working on a very slow glucose-saline drip.

When severe secondary hæmorrhage occurs in a jaw injury, the difficulties of checking it, almost invariably by local pressure, are so considerable that any further aids that can anticipate such an event are invaluable. I do not intend in this letter to discuss in detail the treatment of secondary hæmorrhage in jaw injuries but simply to emphasise the advantage of maintaining a good free passage for quick intravenous therapy.

No. 3 British Maxillo-Facial Surgical Unit, India Command. D. S. HAYTON-WILLIAMS.

THROMBOSIS

SIR,—Dr. Bauer's authoritative article of March 30 describes an entity which in this country has not had the attention it merits, and on which most textbooks give a faulty account of the pathology.

At the Western Infirmary, Glasgow, the late Professor Shaw Dunn always taught that so-called "femoral" thrombosis usually started in the small veins of the calf muscles, especially in the soleus muscle, and he rarely failed to demonstrate this at autopsies. While Dr. Bauer's methods of early diagnosis and treatment constitute an important advance, the desideratum is of course to prevent the initial thrombosis in the small veins. To this end I have for some years suggested to clinicians attending such autopsies that it would be worth getting an electrical appliance for massage of the calf muscles to "plug" into the patient's bedside after operation. It is to be hoped that mechanically minded clinicians will be attracted to this possibility on reading Dr. Bauer's statistics showing the prevalence of the condition.

Glasgow. N. G. B. MCLETCHIE.

SPONTANEOUS LOSS OF SPECIFICITY OF ABSORBED ANTI-Rh SERA

SIR,—Boyd, Boyd, and Warshaver[1] have drawn attention to the spontaneous loss of specificity of absorbed immune hæmagglutinating sera when stored in the icebox under sterile conditions. They state that this phenomenon, which has been observed by them for many years, does not appear to have been recorded previously, and they point out that serious errors can arise in the experimental use of such absorbed immune sera if adequate controls are omitted. Thus samples of anti-M and anti-N sera, absorbed to a point at which sharply specific results had been obtained, were subsequently found to react non-specifically with human red cells so that the results after some months resembled those of insufficiently absorbed sera. The non-specific agglutinins could be again removed by adsorption, but it was observed that they might reappear on more than one occasion.

We wish to draw attention to a somewhat similar phenomenon in the preparation and use of absorbed anti-Rh sera. In order to make sera of good anti-Rh titre universally applicable, the α and β iso-agglutinins may be removed by absorption with A_1 and B cells, or A_1B cells. We have observed that anti-Rh sera of group O, from which the iso-agglutinins have been removed by repeated contact with washed erythrocytes, may after some months of storage in the frozen state produce agglutination of Rh-negative cells of both A and B groups. Our attention was first drawn to this phenomenon by the finding of too few Rh negatives among unselected donors of group A as compared with group O when a certain absorbed group O anti-Rh serum was used, the serum having been stored for some months in the frozen state. Parallel tests with a group A anti-Rh serum revealed that the old absorbed O serum reacted weakly with practically all A cells. We have since observed the same phenomenon in several other batches of group O anti-Rh sera which had been absorbed with A_1B cells, and which had given sharply specific anti-Rh reactions immediately after this treatment.

We have also observed the appearance of anti-B (or a "β-like" agglutinin) in an anti-Rh serum of group B which had been absorbed with A_1rr cells and stored frozen solid for about 12 months. This surprising development was recognised when the serum was found consistently to agglutinate group B Rh-negative cells with which it had previously failed to react. Only some bottles (5 out of 15) in the same batch were affected, and the altered serum in these failed to react with A or O Rh-negative cells while it agglutinated A, B, and O Rh-positive cells to a titre of 1 : 32 (original titre 1 : 64). The loss of anti-Rh potency was therefore not greater than might have been expected on storage, but the appearance of anti-B was astonishing.

It is therefore desirable that these possibilities should be more widely known and that the specificity of absorbed anti-Rh sera should be checked from time to time, not merely to control their content of anti-Rh agglutinins, but to ensure that non-specific agglutinins have not reappeared in the sera. As Boyd et al. have emphasised, the latter phenomenon is quite distinct from non-specific agglutination due to bacterial contamination.

Department of Pathology, University and Western Infirmary, Glasgow. D. F. CAPPELL. MARJORY N. MCFARLANE.

1. Boyd, W. C., Boyd, L. G., Warshaver, E. R. *J. Immunol.* 1945, 51, 191.

THE DUODENAL ULCER CONSTITUTION

SIR,—In my work on a pensions tribunal in the last few years I have made some observations on the "constitution" associated with duodenal ulcer, based on over 200 Service cases. Tall men with a greater distance between the tip of the ensiform and the navel than between the navel and the symphysis pubis, and with definite lines of flexion on the anterior wall of the abdomen, seem to be most liable to duodenal ulcer. These lines of flexion, which are found above rather than below the navel, appear to indicate an increased degree of flexion of the upper three-quarters of the lumbar spine. At the level of the spine which is most associated with flexion the duodenum is firmly fixed by the connective tissue which immediately surrounds it. The first part is, of course, freely movable, being entirely surrounded by peritoneum, but the second and third parts are fixed to the back part of the abdominal wall by the pancreas and the biliary and pancreatic ducts and by the blood-vessels in the neighbourhood. This fixed part is subject to flexion when the lumbar spine is flexed and thus may be pressed upon. Sharp and chronic flexion of the lumbar spine may influence the proper action of the duodenum and thus may be a precursor of duodenal ulcer. The lumbar spine is not so movable in women as in men and is normally much straighter, and the rarity of duodenal ulcer in women may be associated with this apparent anatomical fact.

London. A. RALPH THOMPSON.

THE FILM IN MEDICAL EDUCATION

SIR,—I regret that Mr. Donald Alexander (March 23) is under a misapprehension in that his letter seems to imply that appraisals of medical films are being conducted by the Royal Society of Medicine in collaboration with the Scientific Film Association. Cataloguing is indeed a work of collaboration but appraisals are being conducted by the S.F.A. and not by the R.S.M.

Royal Society of Medicine, 1, Wimpole Street, London, W.1. G. R. EDWARDS, Secretary.

Dr. Cyril J. Austin has just completed 15 years' service as medical superintendent of the Central Leper Hospital at Makongai, Fiji. The hospital is an isolation and treatment centre for New Zealand, the Gilbert and Cook Islands, Samoa, and Tonga. The able-bodied male patients live not in hospital wards but in their own villages; there are separate villages for Fijians, Solomon Islanders, Gilbert Islanders, and Rotumans (Rotuma is a tiny dependency of Fiji), and also a Polynesian village. Each village has a headman who acts as liaison officer between patients and staff, and is generally responsible for the cleanliness of his village and the coöperation of his people. Large areas are cultivated, and patients are paid for their produce; fishing and the rearing of ducks and fowls are encouraged. Inter-village contests in cricket and football arouse enthusiasm, and tennis and boxing are popular.

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Notes and News

THE MINISTER ON THE BILL

At the annual general meeting of the Institute of Hospital Administrators on April 6 Mr. Aneurin Bevan said that as time went on he thought it would be found that some of the speeches on the National Health Service had relatively little to do with the Bill, but were still directed against the proposals which some people had thought were going to be made. On the whole, however, he confessed himself content with its reception; indeed its general principles had found wider approval than he expected. If we were to have a common hospital service, he continued, the voluntary and municipal hospitals must be integrated, and it would be difficult to integrate them if they remained self-governing. But he reminded his hearers that no legislation could give us a great health service if its administrators were not enthusiasts. Democracy meant more than occasionally putting a cross on a voting paper; it meant the daily and hourly participation of workers in policy, and he would like to see not only the medical staffs but also the domestic staffs of hospitals taking an effective part in their administration. Mr. Bevan firmly disclaimed any desire to take responsibility for academic medicine, which was to be entirely self-governing. He believed that the Bill would not create a single additional civil servant. He had also been careful to preserve the civic rights of doctors and hospital workers, who would have their contracts with the regional boards and not with the State and would be free to agitate against the Minister of Health at any time. He was eager that in the new service improvisation, experiment, and individual liberty should be accorded at all levels. It had always been our tradition to make some new service available first to a few through individual generosity. When it had proved its merit the State stepped in to make its benefits available to all. But voluntary effort did not then cease; it continued at some higher level till it was ready to push the State forward once more.

HOME LIFE FOR PARAPLEGICS

THE late war has seen great improvement in the treatment of paraplegics, who are no longer regarded as hopeless and doomed cases, inevitable victims of an ascending urinary infection. It is now realised that a paraplegic even with severe disablement is capable of living a happy if restricted life, especially if his doctor and his family accept a fair share of the responsibility.

At present there are about 500 men in this country suffering from paralysis due to war injury, and a recent survey showed that 40% of these are married men with an average age of 26. The Ministry of Pensions Hospital at Stoke Mandeville has made great strides in the physical reablement of these patients, far more of whom learn to walk again than would at one time have been thought possible. The British Legion has set out to reable them in another way: to ensure that they keep as fit as they can, to remove any feeling of uselessness, to arrange that they can live as normally as possible with their families, and to provide them with work.

St. Dunstan's recently presented the Legion with Walton House, Aylesbury, near to the Stoke Mandeville Hospital, and the Legion has equipped it as a home in which paraplegics and their wives and children can rebuild family life. Walton House, which was opened on April 2, can receive two families at a time, and two are already in residence. Each family has a separate bed-sitting room and a separate kitchen fitted with gas-cooker, sink, and cupboards. All rooms used by the paraplegic husbands are on the ground floor, doors are wide enough for wheelchairs to pass through, and steps down to the street have been replaced by ramps. In the bathroom, pulleys have been fitted so that the men can lever themselves into the bath. Upstairs are children's bedrooms and nurseries. Families will stay for a month, sharing the house with a resident hostess. The wife will be given a history of her husband's case and will be helped to form towards him an attitude free from pitying solicitude, and designed always to remind him of the many ways in which he is whole and normal. She will have the experience of looking after him and at the same time of carrying on her usual duties of shopping, housemanagement, and care of the children.

If at the end of a month the wife decides she cannot undertake the responsibility of looking after her husband the Legion will consider other ways of helping them. Usually such a decision would be a heavy blow to the husband, and the task of the Legion in helping the woman to adjust herself to the demands made on her strength and affection is thus of great importance. Indeed, it might be well to have an experienced psychotherapist at hand to advise her. A month is a very short time in which to learn the effects of so severe an injury on a man's outlook and character; and it may reveal as little of his complete disposition as the traditional honeymoon.

If wife and husband, at the end of their month, are convinced that a happy family life is possible the Legion will bear the cost of adjusting their home to the husband's needs, find the man suitable work, and keep a friendly eye on their future needs.

It might be well if the Legion also formed a bridge between the family doctor and the hospital in which the man was reabled. Spinal lesions are not so common as to offer familiar problems to general practitioners, many of whom would welcome a detailed account from a spinal unit of the care of these patients, including advice on the management of persistent residual urinary infection.

SPECIAL DIETS IN CANTEENS

COMMENTING on last year's conference on special diets in canteens (see *Lancet*, Jan. 5, p. 26), Peter Merchant Ltd., industrial caterers, write that in some of their canteens special diets are now served to patients with peptic ulcers. Apart from a low vitamin-C content, which they ascribe to the sieving of vegetables and fruit, a good nutritional standard is attained; the average consumption of five meals is:

	Protein (*g.*)	*Fats* (*g.*)	*Calories*	*Calcium* (*mg.*)	*Iron* (*mg.*)	*Vitamins* *A* (*I.U.*)	*C* (*mg.*)
3-course meal	33	23	900	445	7·6	5430	11
2-course meal	24	18	636	296	5·0	5430	9

They suggest that the wide introduction of such facilities would be to the advantage of employers as well as employees.

LIVING-OUT ALLOWANCES FOR NURSES

THAT qualified nurses should have the right, if they wish, to live outside the hospitals employing them is warmly advocated nowadays; but when it comes to providing them with the means to do it enthusiasm wanes. Thus the Nurses Salaries Committee of the Ministry of Health, in their latest report,[1] note that they have "had in mind the desirability of encouraging nurses in appropriate cases to live out," and they encourage them on the following scale:

(1) Grade	(2) Total value of emoluments	(3) Value of emoluments provided by hospital for non-residents	(4) Living-out allowance (col. 2 minus col. 3)
	£	£	£
Ward sister	120	20	100
Staff nurse	100	20	80
Enrolled asst. nurse	100	20	80
Intermediate asst. nurse	90	20	70

Emoluments can be provided more cheaply in hospital than services of a similar standard outside; thus even if she received the full value of her emoluments the nurse who chose to live out would have to accept a lower standard of living. As it is, the total value of her emoluments is reduced by hospital charges, and further depleted by income-tax. The resident nurse pays no income-tax on her emoluments. Thus the nurse who exerts that independence which we say we want to foster in her, does so at the cost of a considerable fall in her standard of living. If the Salaries Committee wish to "encourage" nurses to live out, surely they should recommend allowances commensurate with their status.

REPELLING THE MIDGE

DIMETHYL-PHTHALATE (D.M.P.), a repellant used against the mosquito during the war, has proved satisfactory against the midge in trials under the auspices of the Department of Health for Scotland; it is reported as excelling any other repellant. The preparation which up to now has proved the most satisfactory is an emulsion with this formula:

'Lanette wax sx'	5 g.	dimethyl-phthalate	100 c.cm.
triethanolamine	9 c.cm.	water	100 c.cm.
oleic acid	27 c.cm.		

The emulsion is said to be effective for at least two hours after being smeared on the exposed parts; it should not be allowed to get into the eyes or to come into contact with tortoise-shell or plastic spectacle frames. It is hoped that the preparation may be on the market this summer.

1. Revised Recommendations regarding Certain Grades of Nurses. Nurses S.C. Notes no. 10. H.M. Stationery Office. 1*d*.

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TOO FEW DOCTORS

IN an address to the Insurance Institute of London, reported in the *Times* of April 2, Dr. Charles Hill, secretary of the British Medical Association, said that an inquiry by the association in 1938–39 showed that the average person covered by National Health Insurance called on his doctor for more than 5 items of service annually, which could be compared with Lord Plender's estimate of 1·7 before N.H.I. was introduced. The National Health Service would likewise lead to an increase in the demand for medical attention among those entering the scheme, and he estimated that general practitioners alone would be called on to provide some 40 million extra items of service each year. The shortage of consultants might be even more serious, for the public would naturally tend to ask for a consultant's opinion as a right. In certain branches of medicine no consultants and specialists were at present available, and one must conclude that for a good time ahead the promised service could not be provided.

University of Oxford

Schorstein research fellowship.—An election will be held in June.

The fellowship, of the value of £300, will be tenable for one year from Oct. 1 in any medical department or institute at Oxford. Candidates must be graduates of the university, under 35 years of age.

University of London

Among those recently elected fellows of University College are the following members of University College Hospital staff: Mr. A. J. Gardham, Dr. J. C. Hawksley, Mrs. E. L. G. Hilton, and Prof. R. S. Pilcher.

Royal College of Surgeons of England

The Princess Royal, who is an honorary fellow, visited the college on March 29, and examined plans for reconstructing the part of the building damaged by bombs.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting with Mr. W. A. Sewell, the president, in the chair, the following were admitted to the fellowship: George Howard Bell, Leslie John Davis, James Robertson Preston, and Thomas Ferguson (all of Glasgow), Robert Hill (Ayr), and Alexander Adam Kirkland (Dundee), qua physician; and Thomas Hugh Crawford Barclay and Alexander Walker Naddell (Glasgow), John Cunningham Liddle (London), and William Laird Milne (Milngavie), qua surgeon.

Royal College of Obstetricians and Gynæcologists

The following have satisfied the examiners for the diploma in obstetrics:

Pamela M. C. Aitchison, Oliver Azzopardi, Sheila M. Baker, Joseph Baron, Elizabeth Bate, Margaret E. M. Boulton, Muriel Brighton, R. W. Burslem, Joan Collins, Constance M. Cowan, John Cox, Doris A. Craigmile, G. M. Evans, William Hall, N. J. P. Hewlings, H. A. Hezlett, G. I. Isaacs, S. M. Jenner, C. M. Kamdar J. D. Martin, Tudor Miles, Alice K. Montgomery, J. K. Ogden, J. A. Partridge, Charlotte Saba, J. W. Smith, and W. W. Willson.

Faculty of Ophthalmologists

The new council of the faculty, consisting of national and regional representatives, has now been elected by ballot. Each of the six regions is represented by a member and a full-time associate.

Regional representatives.—E. G. Mackie and A. C. Reid; P. Jameson Evans and R. S. MacLatchy; J. J. Healy and W. Simpson; Sir Stewart Duke-Elder and Stewart Macky; J. P. Spencer Walker and A. N. Fergus; W. J. B. Riddell and P. M. Wood.

National representatives.—George Black, R. C. Davenport, J. H. Doggart, P. G. Doyne, O. M. Duthie, C. B. Goulden, F. A. Juler, Frank W. Law, T. Keith Lyle, Ida Mann, H. M. Traquair, David Wilson (members); and C. M. Stevenson (part-time associate).

The annual general meeting will be held at 1, Wimpole Street, London, W.1, on Saturday, June 1, at 2.30 P.M.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. PATRICK CLARKSON, F.R.C.S., 22, Harley Street, W.1. (Langham 4351.)
Dr. H. V. DICK, 30A, Wimpole Street, W.1.
Mr. ANTHONY PALIN, F.R.C.S.E., Litfield House, Clifton Down, Bristol.
Mr. GEOFFREY PARKER, D.S.O., F.R.C.S., 88, Harley Street, W.1.
Dr. DOUGLAS ROBERTSON, 86, Brook Street, W.1, and The Grange, Blechingley, Surrey.
Mr. F. D. SANER, F.R.C.S., 97, Harley Street, W.1.
Dr. J. H. WILLIS, 63, Brighton Road, Sutton, Surrey. (Vigilant 0861.)

THE meeting of the Middlesex County Medical Society, arranged for Saturday, April 13, has been postponed until further notice.

On Active Service

CASUALTIES

KILLED

Captain MICHAEL DEAN, M.B.C.S., R.A.M.C.

WOUNDED

Major K. B. THORNTON, M.B. Lond., D.A., R.A.M.C.

Medical Diary

APRIL 14 TO 20

Monday, 15th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. W. Rowley Bristow: Joint Injuries.

Tuesday, 16th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. J. M. H. Campbell: Paroxysmal Tachycardias. (First Lumleian lecture.)
ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. E. W. Riches: Surgery of the Prostate.
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
4 P.M. *Pathology.* Papers and demonstrations.
SOCIETY FOR THE STUDY OF INEBRIETY
4 P.M. (11, Chandos Street, London, W.1.) Dr. H. J. Norman: Discursive Thoughts on Alcohol and Drugs. Dr. W. R. Bett: Alcoholism and Crime in Ceylon.
PUTNEY MEDICAL SOCIETY
8.15 P.M. (Putney Hospital.) Dr. E. C. Warner: Use and Abuse of some Common Drugs.

Wednesday, 17th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. V. E. Negus: Injuries of the Ear, Nose, and Throat.
ROYAL SOCIETY OF MEDICINE
2 P.M. *Comparative Medicine.* Prof. J. Engelbreth-Holm: Leukæmia and Leukosis in Man and Animals.
UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Dr. A. M. Wright Thomson: Concussion Injuries of the Retina.

Thursday, 18th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. J. M. H. Campbell: Paroxysmal Tachycardias. (Second Lumleian lecture.)
ROYAL SOCIETY OF MEDICINE
5 P.M. *Dermatology.* (Cases will be shown at 4 P.M.)

Appointments

FRAZER, A. D., M.D. Edin.: dermatological specialist medical referee for the county-court districts of Mansfield, Newark, and Nottingham (circuit no. 18), and of Alfreton, Ashbourne, Burton-on-Trent, Derby, and Long Eaton, Ilkeston, Matlock and Wirksworth (circuit no. 19).
LAIRD, S. M., M.D. Glasg., F.R.F.P.S.: venereologist for Ipswich.
LEIPER, JOHN, M.B. Lpool, D.P.H.: temp. M.O.H. for Stanley, co. Durham.
MACMAHON, A. M., M.B.: asst. R.M.O., Tadworth Court, Hospital for Sick Children, Great Ormond Street.
MARKOWE, MORRIS, M.D. Lond., D.P.H.: deputy M.O.H. for Ipswich.
MAY, A. J., M.R.C.S., L.D.S.: dental surgeon to inpatients, Hampstead General and North-West London Hospital.
MEADOWS, S. P., M.D. Lond., F.R.C.P.: asst. physician, National Hospital, Queen Square, London.
OWEN, J. R., M.R.C.P.: honorary dermatologist, Hampstead General and North-West London Hospital.
RIDDELL, MARGARET, M.B. N.Z., D.A.: resident anæsthetic registrar, Hospital for Sick Children, Great Ormond Street, London.
STOKES, W. J., M.D. Lond., M.R.C.P.: Paterson M.O. and chief assistant to cardiac dept., London Hospital, E.1.
VICKERS, H. R., M.B. Sheff., M.R.C.P.: dermatological specialist medical referee for the county-court districts of Doncaster, Worksop and East Retford (circuit no. 18), and of Chesterfield, New Mills, Buxton, and Bakewell (circuit no. 19).
WILLIAMS, D. J., M.D. Manc., F.R.C.P.: asst. physician, National Hospital, Queen Square, London.

Births, Marriages, and Deaths

BIRTHS

ALLEN.—On April 1, at Guildford, the wife of Surgeon Lieutenant W. H. E. Allen, R.N.V.R.—a daughter.
EWAN.—On March 31, the wife of Dr. W. J. S. Ewan, of Aberdeen—a daughter.
HAINES.—On April 4, in London, the wife of Dr. Magnus Haines—a son.
PRITCHARD.—On April 4, at Woking, the wife of Major P. M. M. Pritchard, R.A.M.C.—a daughter.
RYLE.—On April 2, at Oxford, the wife of Dr. J. C. Ryle—a daughter.

MARRIAGES

BATTERSBY—MAYBIN.—On March 27, in Capetown, John Spencer Battersby, M.B., surgeon lieutenant R.N.V.R., to Eve Maybin.
BRAMBIR—MALTBY.—On March 27, at Canterbury, Allen Harvey Brambir, L.R.C.P.E., to Georgina Maltby.

DEATHS

BELL.—On Feb. 27, at Tunbridge Wells, John Grenville Bell, D.S.O., M.B. Edin., lieut.-colonel R.A.M.C. retd.
GUNN.—On April 3, at Crowborough, George Gunn, M.B.E., M.D. Edin., F.R.C.S.E., of Neston, Cheshire.
JEWELL.—On April 1, at Balham, John William Frank Jewell, M.D., M.S. Lond.

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AIR HYGIENE IN DRESSING-ROOMS FOR BURNS OR MAJOR WOUNDS

R. B. BOURDILLON, D.M. Oxfd
L. COLEBROOK, F.R.C.O.G., F.R.S.
MEMBERS OF SCIENTIFIC STAFF, MEDICAL RESEARCH COUNCIL
From Birmingham Accident Hospital and the National Institute for Medical Research

THE importance of cross-infection in hospitals is now widely recognised. It has been studied in this country,[1 4 6 7 16 18 22 23 25 27 28 30–32] in America,[3 5 10–13 15 19 20 26 29] and in other countries.[8 14 24] Some writers have emphasised the part played by direct contact in the transmission of these infections, others the danger of airborne transmission of pathogens by the agency of either dust particles or finely divided droplets derived directly from the respiratory tract.

Recognising both airborne and contact infection as sources of danger, the authors of a memorandum on the dressing of wounds (Medical Research Council 1942)[17] recommended, in addition to a strict no-touch technique and the wearing of masks, that ward floors should be oiled at short intervals to keep down dust; that dressings in the wards should be done with closed windows and the minimum of traffic; and that the sweeping of floors should be completed half to one hour before dressings are begun. It was also laid down that only one wound must be uncovered at a time.

If faithfully carried out, these recommendations must be of great value. They will not, however, ensure a dust-free atmosphere in an ordinary surgical ward and will not suffice to avoid cross-infection whenever large raw areas have to be exposed for dressing. This conclusion is based on the experience of the burns unit at the Glasgow Royal Infirmary during 1942–43, when these measures were put to a thorough test.[4]

The practice of dressing all such wounds in a special room designed for that purpose should have considerable advantages; but, unless special precautions are taken, it must involve the danger of exposing each successive wound to a cloud of organisms disseminated from the dressings of the previous patient. This paper describes a study of this danger and the means taken to avoid it by a special system of ventilation installed in the burns unit of the Birmingham Accident Hospital.

ARRANGEMENT OF THE DRESSING-STATION

The station consists of a dressing-room 16 ft. 6 in. × 15 ft. × 12 ft. 3½ in. high (volume = 3042 cu. ft.), with two hatches, each with an air-lock, leading to a sterilising-room, and a single door leading to a corridor. The adjacent part of the corridor is converted into an air-lock by two doors which isolate a length of 16 ft. outside the dressing-room from the rest of the corridor. The windows of the dressing-room are sealed with tape, the walls are covered with washable paint, and the floor is treated with spindle oil once weekly.

Ventilation Plant.—This was designed to provide warm filtered air to the dressing-room in quantity adequate both to ensure an atmosphere almost free from bacteria at the start of dressings and to cause the rapid evacuation of organisms disseminated through the air in the course of each dressing. The plant was installed by the Carrier Engineering Co. Ltd. to the order of the Medical Research Council. It delivers about 500 cu. ft. per min. of filtered, warmed, and humidified air to the dressing-room. The air is sucked from an inlet duct on the roof through a glass-wool filter by a centrifugal fan driven by a ½ h.p. motor. It then passes over a steam-heated grill, controlled by a thermostat, through a Multivee Vokes filter and then through a set of 48 Carrier particulate paper filters. It then passes steam jets, operated by an automatic humidistat whenever the humidity falls below the desired level, over baffle plates and through four multiconed distribution orifices fixed to ducts just below the ceiling of the dressing-room. The air leaves the dressing-room by an opening under the door (2¼ in. high × 48 in. wide), crosses the corridor, and passes through an exhaust fan to the outside of the building.

During the tests described in this paper the controls were set to give an air temperature of 70°–75° F and a relative humidity of 50–60%. The plant was kept running for an hour before the period of dressings and half an hour or more after they were finished. An interval of 5 min. or more was always allowed between the exit of one patient and the entry of the next, to bring the aerial contamination to a low level.

The use of 3 filters in succession is designed to reduce replacement costs by providing relatively coarse and cheaply replaceable filters to trap the grosser particles and so prevent the rapid clogging of the more expensive particulate paper filters. With the same object in view, the glass-wool filter was later superseded by a Vokes 'Kompak' cotton-wool filter. The inlet point of the system is about 5 ft. above the hospital roof and about 73 ft. above the street level but only 35 yd. from a brewery and 50 yd. from a very smoky chimney.

Method of Air Sampling.—Air was sampled for bacteria by collection in a slit sampler similar to that described by Bourdillon et al.[2] but enlarged so as to sample either 7 or 23 cu. ft. of air per min. In these samplers air is sucked through a narrow slit on to an agar plate, which is slowly rotated under the slit so as to secure uniform distribution. Nutrient agar containing 5% of horse blood was used on 6-in. Petri plates for most tests. The plates were incubated aerobically for 24 hours at 37° C, and then the colonies were counted. The counts thus include all organisms giving visible colonies under these conditions of incubation—i.e., most of the bacteria and most of the moulds that may be present.

This method of air sampling shows the number of particles carrying bacteria, &c., but does not, so far as is known, split up aggregates of bacteria, each of which is counted as a single colony. It is exceptionally suitable for studying rapid changes in the bacterial content of the air. Observations were also made with open Petri plates collecting organisms by direct sedimentation.

Accurate Timing of Changes in Concentration of Airborne Bacteria.—In some tests it was important to know the exact moment at which bacterial clouds were liberated, to correlate their appearance with the movement of the patients' bandages or other events. On these occasions two observers made detailed notes on the times at which bandages, &c., were moved and on the time at which sampling began on the rotating agar plates. Since the speed of rotation was uniform, it was easy to calculate the moment at which any given radial line on the plate passed under the slit and hence to ascertain the moment at which any particular group of colonies had been deposited. The error in doing this was of the order of a few seconds and was caused chiefly by the delay between visual observation and the writing down of notes on the surgeon's or nurse's actions. The culture plates were counted through a screen divided by radial lines into sectors representing 30 sec., 10 sec., or 5 sec., as proved most suitable for the test concerned. Examples of this close timing are shown in figs. 4 and 6.

It is evident that, if the movements of air in a room are irregular, the time at which a bacterial cloud will reach a sampler will have no regular relation to the time of emission of the cloud; and the concentration of the cloud on reaching the sampler will also depend on the degree of diffusion en route. Therefore, in tests in which close timing was desired, a fan was placed to drive air across the patient towards the sampler, the distance between fan and sampler being about 10 ft. This reduced the delay between emission of bacteria and their arrival at the sampling point to a very few seconds. It also to some extent regularised the degree of dilution of the cloud before sampling.

Ventilation Turnover and Rate of Removal of Bacteria from a Room.—In discussing aerial contamination and problems of ventilation it is convenient to express the rate of removal of the contaminant in terms of "equivalent ventilation turnovers per hour" or equivalent air changes per hour. To say that bacteria are removed at a rate equal to 10 air changes per hour means that all the agents causing their disappearance—e.g., death, sedimentation on to solid surfaces, removal in an airstream—together produce the same rate of disappearance

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as would be caused by introducing a supply of clean air equal to 10 times the volumes of the room in each hour. In this type of calculation it is always assumed that the clean air is completely mixed with the dirty air in the room as fast as it is introduced—i.e., that there is no simple displacement of unmixed air such as happens when a piston moves along a cylinder containing air. Although this assumption can never be strictly true, it is a reasonable approximation to the truth in normal ventilation when much irregular mixing of air takes place. On this assumption the removal of contaminated air follows the simple logarithmic law common in physical and biological processes, where the rate of disappearance of a substance at any moment is proportional to the concentration present at that moment. This law may be expressed by the convenient equation:

$$T = \frac{138}{t}(\log_{10} n_1 - \log_{10} n_2)$$

where T=equivalent turnovers per hour, and t=the time in minutes between the moments at which the number of bacteria-carrying particles are n_1 and n_2.

In considering new ventilation proposals it is convenient to remember that each successive air change (turnover) reduces contaminants in the ratio $1/e$, that is 1/2·7. Three changes reduce it to $1/e^3 = 1/20$ approx. and six changes to $1/e^6 = 1/400$ approx. Other values can be seen at once by reference to a table of powers of e. (For those unaccustomed to working with logarithms it will suffice to remember that a fall of 50% in the bacterial count in 40 min. represents about one turnover per hour. A similar fall in 10 min. would therefore represent 4 turnovers.)

One advantage of this form of expression is that the equivalent turnovers are additive. Thus, if bacteria are removed by death and sedimentation at a rate equal to 5 turnovers per hour (as is common with sneeze particles or a fine spray of broth culture of *Strep. salivarius*), the addition of clean air at a rate equal to 10 turnovers per hour will cause a total removal-rate equal to 15 turnovers per hour.

EFFECTS OF VENTILATION ON AIR CONTAMINATION DURING DRESSINGS

A long series of measurements was made of the total numbers of bacteria-carrying particles found in the air of the dressing-room during a morning's work on dressing patients. For reasons discussed later, the total organisms were taken as an index of contamination rather than the limited number of species which it is customary to describe as pathogens.

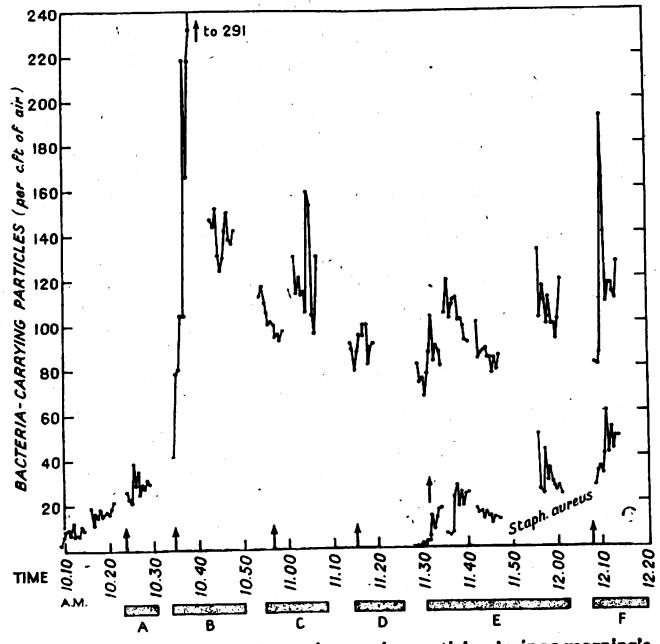

Fig. 1—Counts of airborne bacteria-carrying particles during a morning's dressings with little ventilation. Upper counts = total organisms. Lower counts in right lower corner of chart = *Staph. aureus* only (cases E and F were infected with this organism). Arrows in lower part of chart show time at which removal of bandage began with each patient. Hatched areas show time during which each patient was in the dressing-room.

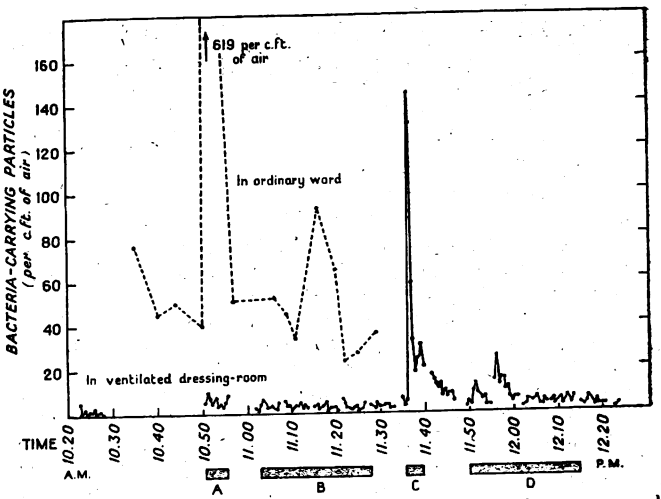

Fig. 2—Counts of airborne bacteria-carrying particles in ordinary ward without forced ventilation and in dressing-room with ventilation at 11 turnovers per hour. Hatched areas show time during which each patient was in the dressing-room and are not applicable to the dressings done in the ward.

In the tests the normal routine of the unit was followed, in that the patient was wheeled in on a bed of which the mattress and oiled underblanket were covered before entry with a freshly laundered sheet, and the patient was covered with a similar sheet, with no top blankets. All patients were masked and the staff dressed in sterile coverings as described below. A fan was used to blow the air from the patient towards the sampler to ensure accurate timing.

Results with Poor Ventilation.—A limited number of tests were done with the ventilation plant turned off and the doors shut. While obviously undesirable, this practice is not uncommon in hospitals. Owing to an outbreak of cross-infection following one such experiment (described later), only a few tests of this type were done.

Fig. 1 shows the course of air contamination during a morning's dressings with ventilation off and doors shut (except for one opening of 2/3 sq. ft. into the air-lock and frequent passage of persons and bedsteads in and out of the room). It is noticeable that, whereas patient A with a small burn of the hand emitted few bacteria, patient B with a burn of the thigh shed large numbers when her crêpe bandage was unwound. This sudden rise in airborne bacteria was followed by a rapid partial fall (due to the spread of the bacteria round the room by the fan), but the counts remain above 80 per cu. ft. except for brief intervals. Patients E and F had burns of the trunk infected with *Staph. aureus*. The removal of their dressings liberated considerable numbers of these pathogens, giving counts with a peak of 60 per cu. ft. and a mean level of over 25, which did not fall below 22 per cu. ft. until more than 25 min. after the last patient left the room.

On other mornings of dressings without forced ventilation it was shown that, after the last patient left, the concentration of airborne bacteria fell at a rate equivalent to about 1·1 air changes per hour. This means that it took 37 min. for the numbers present to be halved by quiet settling, &c. At this rate no practicable interval between the exit of one patient and the entry of the next would avoid the danger of cross-infection.

It is not uncommon to find high figures such as the above figures for air contamination, especially if unoiled blankets are allowed in the room. Thus Williams et al.[28] found an average count of 67 per cu. ft. from 9 A.M. to noon in a ward dressing-room.

When wounds are dressed in an ordinary ward, the air contamination may rise much higher owing to disturbance of blankets. The rate of fall will depend chiefly on the

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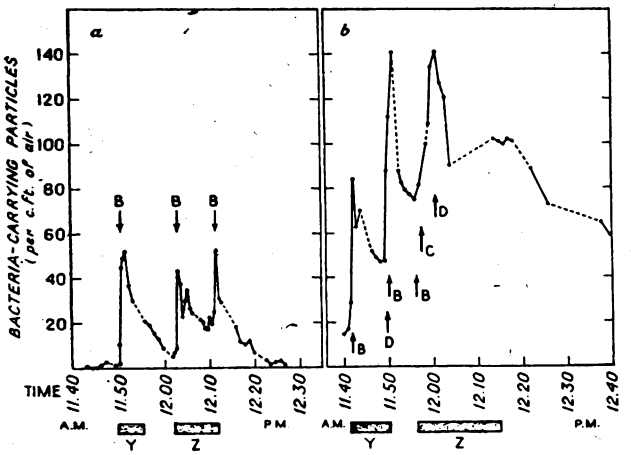

Fig. 3—Counts of airborne bacteria-carrying particles when uncovered blankets were allowed on the bed: (a) with ventilation (9 changes per hour); (b) with plant switched off. The same burns were dressed on the two days. B = moments at which blankets were gently disturbed; C = moment at which cutting and removal of bandage began; D = moment at which a woollen bedsock was pulled on to patient's foot and leg. Interrupted lines represent intervals between samples. Hatched areas show time during which each patient was in the dressing-room.

ward ventilation. The dotted curve in fig. 2 shows the counts obtained during a morning's dressings in a normal hospital ward with some hopper windows and one pair of swing-doors open.

Results with Fair Ventilation (about 10 turnovers per hour).—Fig. 2 shows in the lower curve (uninterrupted line) the air counts during a morning's dressing with ventilation at 11 turnovers per hour. The curve illustrates the chief features found in a series of 20 tests with this ventilation:—

(1) There is no build-up of aerial infection. When bacteria are liberated they are removed before they can accumulate. The first part of the sudden fall from a high peak is due to the dispersal of the cloud of bacteria round the room. The subsequent slower fall is due to removal from the room by ventilation.

(2) An interval of 5 min. between the exit of one patient and the entry of another is sufficient for a considerable reduction in the airborne bacteria but not for complete freedom from danger of infection (see the period 11.39 to 11.45 A.M. in fig. 2). On theoretical grounds a ventilation-rate of 11 turnovers per hour should reduce the aerial impurities in the ratio of 1 to 1/2·7 every 5½ min. In practice the rate of disappearance was usually higher than this, owing partly to the natural rate of fall of the larger airborne particles and partly to direct downward displacement by the airflow from the ventilation plant. Thus the rate of die-away from 11.41 A.M. to 11.46 A.M. in this test is equivalent to an effective ventilation-rate of 14·6 turnovers per hour.

(3) With careful unhurried technique relatively few bacteria are liberated during the dressing of most patients with small burns.

(4) Most patients with large burns of the trunk and thighs liberate large numbers of bacteria. Some cases of small burns—e.g., patient C (fig. 2) with a small fairly clean burn on the knee—may also do so with no obvious cause.

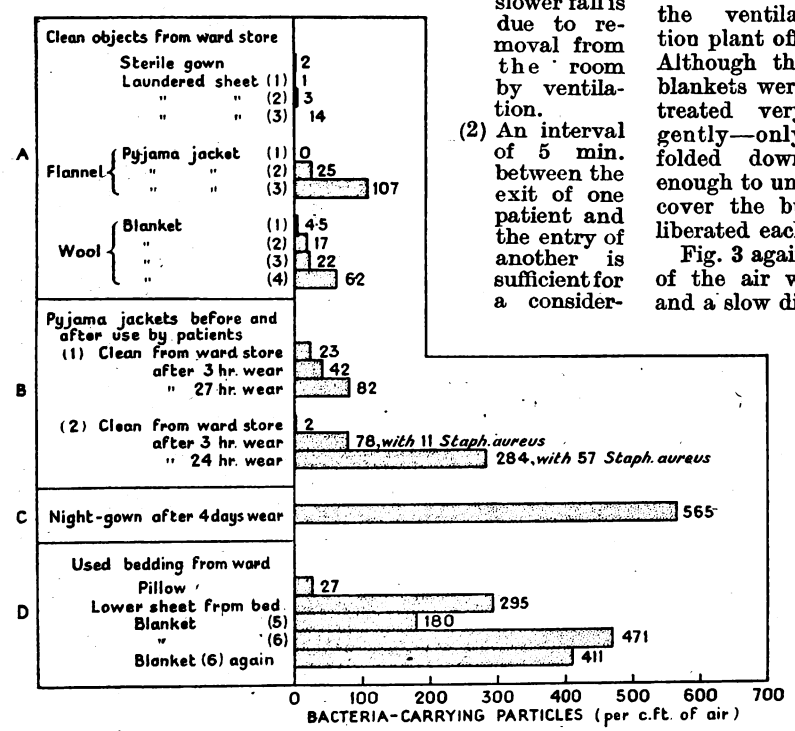
Clean objects from ward store
Sterile gown 2
Laundered sheet (1) 1
" " (2) 3
" " (3) 14
A
Flannel
Pyjama jacket (1) 0
" " (2) 25
" " (3) 107
Wool
Blanket (1) 4·5
" (2) 17
" (3) 22
" (4) 62
Pyjama jackets before and after use by patients
B
(1) Clean from ward store 23
after 3 hr. wear 42
" 27 hr. wear 82
(2) Clean from ward store 2
after 3 hr. wear 78, with 11 Staph. aureus
" 24 hr. wear 284, with 57 Staph. aureus
C
Night-gown after 4 days wear 565
Used bedding from ward
D
Pillow 27
Lower sheet from bed 295
Blanket (5) 180
" (6) 471
Blanket (6) again 411
0 100 200 300 400 500 600 700
BACTERIA-CARRYING PARTICLES (per c.ft. of air)

Fig. 5—Counts of airborne bacteria-carrying particles produced by shaking articles 3 or 4 times in the dressing-room.

SOURCES OF AIR CONTAMINATION

Blankets.—It is now widely recognised that unoiled blankets form prolific sources for disseminating airborne bacteria.[10 11 20 23] This effect is illustrated in the test shown in fig. 3 (*a* and *b*), where 2 patients were wheeled in on beds covered with ordinary blankets. In test (*a*) ventilation was at 9 turnovers per hour; in test (*b*) the same patients were treated with the ventilation plant off. Although the blankets were treated very gently—only folded down enough to uncover the burns concerned—a cloud of bacteria was liberated each time the blankets were disturbed.

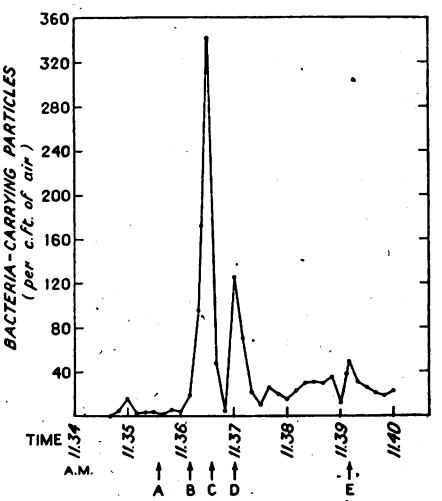

Fig. 4—Bacterial counts from culture plate (fig. 6) plotted at 10-sec. intervals. Arrows indicate moments at which events happened: A, entry of patient; B, nurse started cutting bandage; C, nurse stopped cutting bandage; D, surgeon lifted bandage and wool and dropped them in bin; E, patient waved arm vigorously.

Fig. 3 again shows the contrast between rapid clearing of the air without build-up when ventilation is fair, and a slow die-away with serious build-up of contamination when the ventilation is stopped. In (1) there is little carry-over from one patient to the next; in (2) a great deal.

The Patient's Bandages.—Under the conditions prevailing in our dressing-station bandages have been the chief source of clouds of airborne bacteria during dressing. The number liberated varied greatly with different patients and different parts of the body. Fig. 6 shows the culture plate from which was plotted the curve which is shown in detail in fig. 4 (and in less detail as part of fig. 2).

The very close synchronisation between the movements of the bandage and the appearance of high or low concentrations on the culture plate affords good proof that the dense clouds of bacteria liberated between 11 hr. 36. min. 17 sec. and 11 hr.

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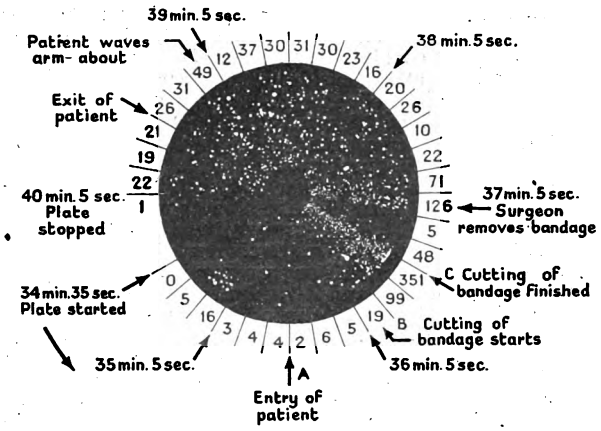

Fig. 6—Photograph of culture plate showing colonies grown from bacteria collected from the air during the dressing of a small burn. The radial lines, if produced, would divide the plate into sectors each representing 10 sec. during which 1·18 cu. ft. of air passed through the sampler (total for whole plate = 39 cu. ft.). The numerals in each sector show the number of colonies in each period. Clock times are shown at the end of some radial lines. Arrows indicate time of the more important events in the dressing-room during sampling on to this plate.

37 min. 5 sec. arose from the bandages when moved. The secondary cloud at 11.37 in figs. 4 and 6 synchronised with the surgeon's picking up the bandage (which had been cut open by a nurse between 11 hr. 36 min. 10 sec. and 11 hr. 36 min. 35 sec.) in a pair of forceps and dropping it into a waste bin. The lesion being dressed was a granulating wound about the size of a shilling on the point of the knee. A swab from it on this occasion yielded only *Staph. aureus*, whereas a moist swab made from the bandage yielded large numbers of diphtheroid bacilli besides *Staph. aureus*. On other occasions when this lesion was dressed a similar high degree of air contamination was noted.

Fig. 7 shows a cloud of bacteria liberated during the removal of the crêpe bandages and wool from a stout patient with extensive burns of both buttocks and thighs. The dressings, which had been unchanged for 5 days owing to the patient's poor general condition, were considerably soiled with serous discharges from the burns and with excreta. Cultures from the burnt areas gave abundant growths of gram-negative cocci (*Diplococcus crassus* type) and of coliform and diphtheroid bacilli. These types were also predominant on the air-sampling plates.

Pyjamas, Sheets, and Pillow-cases.—A series of tests was done in which pyjamas, sheets, &c., were shaken 3 or 4 times in the dressing-room, and the bacteria liberated were estimated by a sampler about 3 ft. distant, used directly after the shaking. Ventilation was at 8 turnovers per hour, and sufficient time was allowed between each test for the air to become nearly clear again. The air was sampled before each test. The increases in colony counts per cu. ft. of air due to shaking each object are shown in fig. 5.

The first tests, those of shaking a sterile gown and a clean sheet, show such low figures that we may conclude that the process of shaking an object did not liberate any large cloud of bacteria from the persons or clothes of the operators. The test on clean sheets shows that, as would be expected with a well-conducted laundry, the linen or cotton goods reach the wards in nearly sterile condition.

Flannel and woollen goods are in a different category, since in most laundries they are not heated to a bactericidal temperature. The results for clean pyjama jackets are variable and show bacterial contamination which is appreciable but not sufficient to show any deficiency in laundering below the standards now practicable. The results emphasise the fact that all woollen or flannel objects must be regarded as infected, whether freshly laundered or not. (It may be recalled that hæmolytic streptococci, identical in type with those causing infections in the burns unit of the Glasgow Royal Infirmary, were isolated on 2 occasions from freshly laundered blankets.[4]) The tests in groups B and C show that pyjama jackets or night-gowns may become very heavily contaminated and that such contamination may be serious within 3 hours of the patient putting on the garment. These results confirm the view that, if good asepsis is desired, patients should put on clean jackets or night-gowns as recently as possible before entering an operating-theatre. If really clean air is desired, these garments should be oiled.

Movements of Surgical and Nursing Staff.—When female nurses or male doctors, wearing sterile gowns, &c., just as for dressings, walked briskly round the room,

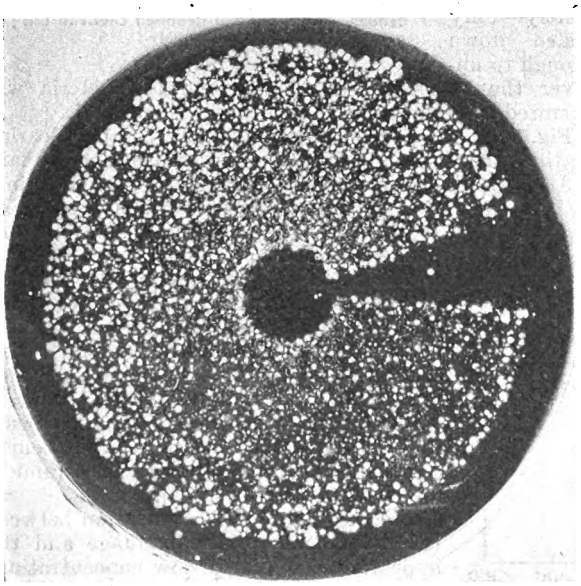

Fig. 7—Colonies of bacteria liberated in dressing a large burn of buttocks and thighs (154 per cu. ft. of air; 6000 in the 5½-min. sample).

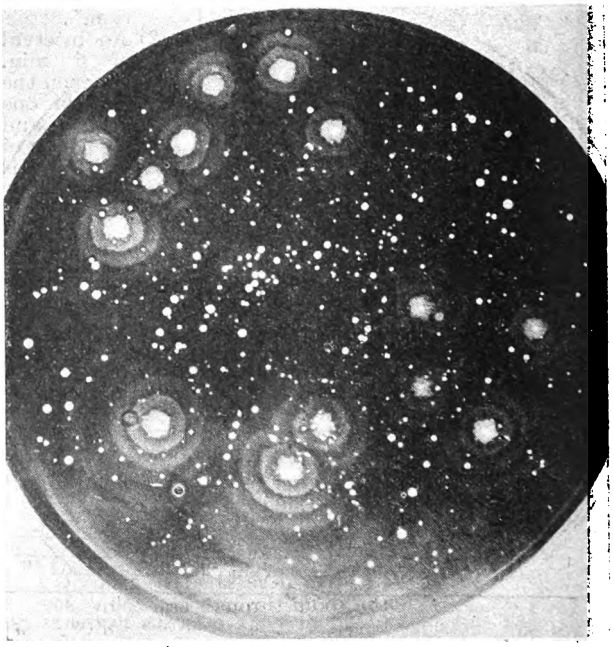

Fig. 8—Colonies of *B. proteus*, showing typical rings, and other organisms liberated in dressing an infected burn.

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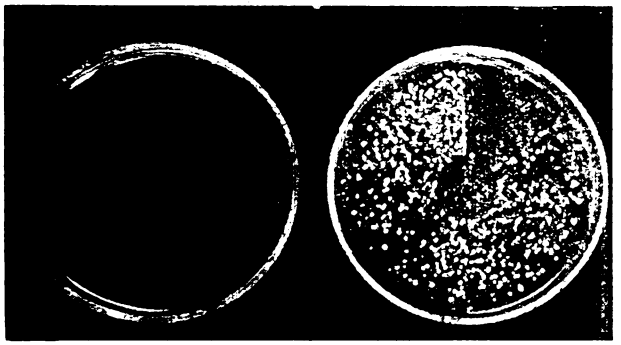

(a) (b)

Fig. 9—Culture plate (air of room little disturbed by wheeling bed in quietly): (a) before shaking night-gown, no colonies; (b) after shaking night-gown 3 times at 3 ft. from sampling-point, 1133 colonies = 566 per cu. ft. of air.

sampling of the air at 3 ft. from the floor showed an appreciable increase of bacterial contamination—e.g., about 13 bacteria-carrying particles per cu. ft. in the case of the nurses and 7·5 in the case of the doctors. When there was no forced ventilation a similar test showed a somewhat greater increase in the case of the nurses—to about 30 per cu. ft.

Entry of Fresh Patients and Beds.—Fig. 6 shows that there was no appreciable increase of bacteria-carrying particles in the air when a patient, covered with laundered sheets, was wheeled into the dressing-station on his bed. When the bed was wheeled in without the patient (fig. 9 *a*), the result was the same.

Completely different results were obtained in a few tests where patients were brought in on a trolley and lifted (without supporting stretcher) on to a table. In these cases large clouds of bacteria were liberated by movements of the patient's blankets and/or clothes.

Air-supply before and after Filtration.—Numerous tests were made with a slit sampler on the hospital roof close to the intake of the ventilating plant. These gave counts of 0·7–6·8 per cu. ft., with an average of 1·0–2·0 on most days. The site was only about 35 yd. from the roof of a brewery, which may have been the source of the figures of 5 and 6 per cu. ft. that were found occasionally. It is hoped to describe these tests more fully later.

No aerobic pathogens were detected in these tests, and only a few *Clostridia welchii*. It would be far safer to use this roof-top air without any filtration at all than to work in badly ventilated rooms. In practice, however, coarse filtration is not costly and is fully justified owing to its removal of flies and the larger particles of dirt.

Roof air filtered through 2 layers of serge filter cloth (grade S.O.3) gave a transmission of about 50% of the bacteria-carrying particles. Tests of the air reaching the dressing-room after coarse filtration through Vokes Kompak and Multivee filters showed an average count of 0·18 when the roof air gave 1·86 per cu. ft., and 0·077 when the roof air gave 0·92, showing transmission through the filter of 9·8% and 8·4% respectively. On another day, with the Kompak filter only, the air in the dressing-room contained 0·14 per cu. ft., but the roof air was not measured in this test.

With the fine filtration provided by using Carrier particulate filters after glass-wool or Kompak, and Vokes Multivee filters, very pure air was obtained. The bacterial content of the air in the unoccupied dressing-room was studied by sampling through a pipe of 2-in. bore leading through a hole in the wall of the room. Considerable precautions were necessary to ensure that no outside air entered the room through cracks owing to wind pressure, and reliable results were only obtained after sealing all window cracks and small holes, such as a dry sink trap and the overflow pipe of a flushing cistern.

Two tests, each of 9 culture plates, then gave total counts of 14 and 16 colonies from samples of 1008 and 1152 cu. ft. respectively. After correcting these figures for our average contamination-rate of 0·9 colonies per 6-in. plate by deducting 8, the figures came to 6 and 6·9 colonies per 1000 cu. ft. of air—i.e., 1 colony in 168 and in 144 cu. ft. respectively. It is therefore probable that the bacterial contamination of the air supplied by the complete filter plant did not exceed 7 bacteria-carrying particles per 1000 cu. ft. It is possible that the air leaving the filters was much purer than this, and that the observed contaminants came from objects in the room or from the distributing ducts.

It also appears that the filtration in the complete ventilation plant reduced the counts of bacteria in air from the roof by more than 99·5 per cent.

In samples obtained with an observer and the sampler inside the room the lowest counts in a series of 7 and 8 plates averaged 21 colonies per 1000 cu. ft.—i.e., 1 in 48 cu. ft.

For comparison, the average counts of bacteria-carrying particles which have been found with slit samplers in the air of various types of room are as follows:

	*Colonies per cu. ft. of air**
Finely filtered air, as described in the unoccupied dressing-room	0·005 to 0·01
Coarsely filtered air as described, with one observer in room	0·05 to 0·2
Air 6 ft. above hospital roof	0·7 to 7
Air of this dressing-room after usual activities before first patient enters (ventilation 10 t.p.h.)	0·14 to 3
Hospital operating-theatres, according to activity and ventilation	2 to 150
Large engineering shops with high roofs and oily floors	4 to 20
Normal factory shops with moderate ventilation	10 to 20
Busy typists' or accounts offices	15 to 60
Crowded canteens	50 to 250
Hospital wards in normal activity	10 to 100
,, ,, during bedmaking	up to 2000

* After collection on blood-agar plates and incubation for 24 hours at 37° C.

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To be concluded

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PSYCHOLOGICAL ASPECTS OF PSORIASIS

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THE ætiology of psoriasis is obscure. It has been attributed to nervous influences, fungi, metabolic disorders, abnormalities of endocrine secretion, and deficient liver function. But none of these theories has been generally accepted. It is known that psoriasis is not infectious, that a tendency to develop it is hereditary in about 30% of cases (Barber 1938, Roxburgh 1944), and that trauma sometimes determines the site of a patch.

The "neuropathic hypothesis" goes back to Tilbury Fox (1873), Barduzzi (cited by Brooke 1911), and Weyl (1883). Adherents of this theory found support in reports of some spectacular cases brought on by shock, grief, or anxiety, or in the coexistence of psoriasis with various nervous symptoms (Eulenburg 1878, Bourdillon 1888, Polotebnoff 1891, Kuznitzky 1897, Bunnemann 1924, and many others). More recent converts to this hypothesis are Becker and Obermayer (1940) who say:

"We have noted in several instances a generalised flare-up of pre-existing eruptions of limited extent and the outbreak of generalised acute psoriasis after nervous or mild shock. Secondly, our social studies have shown that patients with psoriasis show significant social factors preceding the eruption, similar to those preceding outbreaks of the neurodermatoses. Thirdly, other factors are seen in common—namely, the age of onset, improvement in the summer and aggravation during the winter, frequency of cases in the tropics and lessened frequency in the Negro race. These facts lead us to believe that, while there may be other causative factors, the factor of neurocirculatory instability is an important one in the causation and perpetuation of psoriasis."

What follows is an exposition of findings obtained on psychiatric examination of 86 unselected military patients with psoriasis.

Biographical studies extending over about two hours in each case were made. The sample is analysed in table I.

TABLE I—ANALYSIS OF CASES OF PSORIASIS

1. Sex: male, 74; female, 12.				
2. Course of illness when interviewed: acute, 17; chronic, 69.				
(i) *Onset:*				
Before service				56
Since enlistment				30
(ii) *Frequency of attacks:*				
First attack at time of examination				16
Previous attacks				23
Continuous				47
(iii) *Duration of illness:*				
From early childhood either continuous or with free periods				14
For 6 years' duration or more				40
Recent (within the last 5 years, plus relapses)				32
3. History of psoriasis in the family (parents or siblings)				24
		Psoriasis		*Army average*
4. Rank	W.O. and N.C.O.	23% (20)		20%
	Privates or equivalent	77% (66)		80%
5. Type of enlistment	Reservists, regulars	1% (1)		2%
	Territorials and volunteers	40% (34)		38%
	Conscripts	59% (51)		60%
6. Length of service	Over 5½ years	12% (10)*		24%
	2–5½ years	60% (52)		60%
	1–2 years / Under 12 months	28% (24)		16%
7. Age on examination	18–20 years	16% (14)*		7%
	21–30 years	46% (40)		46%
	31–44 years	38% (32)		47%
8. Marital status	Married	49% (42)		55%
	Single	51% (44)		45%
9. Intelligence	Within normal limits	95% (82)		..
	Mental defectives	5% (4)		..

* The difference between the sample and the Army average is probably due to the fact that early intakes with psoriasis report sick more readily than soldiers who have been in the Army a long time.

Verbatim notes of every interview and a detailed report on every patient were kept.

In 14 of the 86 patients examined psoriasis started in early childhood, and no assessment of their personality before the onset of the psoriasis could therefore be made. Of the remaining 72 patients whose previous personality could be made out with reasonable accuracy, 29 were classed as either emotionally well or fairly well adjusted (well-adjusted group); 29 showed definite personality deviations before the onset of the skin affection, and 14 were psychiatrically ill at the time of its onset (maladjusted group). Of those described as psychiatrically ill 8 had anxiety states, 3 hysteria, 1 reactive depression, and 2 psychopathic personalities, one with emotional abnormality and the other with antisocial trends.

The following description of personality types is based on the 43 patients of the maladjusted group.

PREVIOUS PERSONALITY

According to the prevailing characteristics 5 personality types could be identified: (1) compulsive, (2) over-aggressive and unaggressive, (3) bisexual, (4) phobic, and (5) hysterical.

Compulsive Type (11 patients).—Men of this type unreasonably expend their energy on work. Originally spurred on by fear of a threatening and punishing father or by desire to please their over-ambitious mother, they afterwards became self-propelled. The hated whip which lashed them into over-activity has long ceased to exist, but the urge to overwork is now part of themselves and still persists. Like hunted animals whose pursuer is close behind they race along the road to success until they are exhausted. Usually they make a success of their civilian and Army careers, but sometimes they reach for objectives beyond their grasp. They go to an enormous amount of trouble to achieve perfection at work; but they always doubt its correctness, however carefully it has been done or checked. They like to do their work in their own way and in their own time; if they are rushed or overburdened with work they are apt to lose their heads. They are tense and anxious, and somehow they always have something to worry about. Uncertain of themselves, they react disproportionately to failures and reverses, to rebuffs and to criticism. Fear of their superiors, originating from their attitude towards their fathers, is mingled with hate against restricting authority, which only rarely they dare to vent. Because restricting authority has become part of themselves, their hate against it is of necessity largely self-directed.

Over-aggressive and Unaggressive Types (14 patients).—(1) *Over-aggressive:* The 3 men in this subdivision were characterised by their refractory and obstreperous behaviour. Instead of accepting parental dictates, like the compulsive type, they rebelled against it and continued to kick against authority in later life. One of them, a schizoid psychopath, "refused" to learn reading at school, was sent to an approved school because of larceny, threw up one job after the other because he did not like to take orders, and had seven charges during his brief Army career for disobeying orders, insolence to N.C.O.s, and absence without leave. But open display of aggressiveness does not lead to emotional conflict unless the exhibited aggressiveness is only a trickle out of an enormous reservoir, or is accompanied or followed by feelings of guilt.

(2) *Unaggressive:* Browbeaten and mollycoddled children are apt to turn into unaggressive and timid adults (timid because display of aggressiveness might jeopardise their good relationship to the world round them). They need affection, which they might lose if people could guess the amount of aggressiveness which they hide. These people have never been able to hold their own in arguments or fights. Any idea of violence or even of killing a chicken is abhorrent to them. The sight of animals being ill-treated upsets them unduly, and the sight of blood may make them faint or turn their stomachs. As soldiers they dread going into action and do badly if they have to go. Their mind is preoccupied with killing, death, mutilation, and the futility of warfare. In their

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social relationships they are governed by an endeavour to be on good terms with everybody and to be well liked. Consequently they are quiet, conciliatory, and over-obliging. Vaguely aware of their own aggressive impulses they are shy and self-conscious in social contacts, shun the limelight and crowds, and are harassed by feelings of inferiority. Intense feelings of inferiority were a prominent feature in 3 of these patients.

(3) *Ambivalent:* More than is usual some of the patients were double-edged in their attitude towards near relations—i.e., they expressed and displayed feelings of self-sacrificing affection to members of their family whom they had good reason to hate and whom they actually hated.

Bisexual type (8 patients).—In forming its character a child identifies itself with both his parents, whether they are good or bad. These parental characteristics, if they blend, may exist happily together in an individual. Mental disharmony, internal struggle, and internal suffering ensue, however, if mental characteristics appertaining to the parent of the opposite sex grossly prevail in the child, if characteristics of a rejected parent have been taken over, and if the internal parental images remain separate figures at loggerheads.

Of this group 5 were male and 3 female. With one exception they are all offsprings of unhappy families. All of them rejected the parent of their own sex, usually because of his or her vile temper, and adored the parent of the opposite sex, with whom they identified themselves to an unusual degree. As a result of this identification the male patients had become effeminate, and the female patients masculine, in thought, feeling, manner, and behaviour; 4 of them clearly realised that they harboured two different personalities in themselves, whereas the others were unaware of their psychological difficulties.

Typical of this group were a young woman and a young man. The young woman, a testy disgruntled creature, had been compelled since her school days to look after her invalid mother and do the household duties. She had always repudiated her feminine rôle and wanted to emulate her father, an ex-regular soldier. The young man, powerfully built like his violent-tempered father, was of a blustering type. To all appearances he was a bully. But this was only a façade; behind it he was shy, self-conscious, passive, and dependent. He called himself a windy rat. Though married and potent, he was aware of homosexual phantasies of a passive nature.

Bisexual trends, in contrast to frank perversions, breed morbid anxiety. Various morbid fears were commonly found in this group.

Phobic Type (7 patients).—Phobias arising from similar psychological sources are a prominent feature in some individuals. A sergeant belonging to this group, for instance, considered himself one of the cleanest persons of the world. In fact, he had a phobia of infection and a washing compulsion. Because he was afraid of infection he never used public lavatories; he put 'Dettol' into his daily bath and became anxious and very troublesome if washing and sanitary facilities were, in his opinion, inadequate. Also included in this group are 3 men who had anxiety symptoms of a phobic nature subsequent to serious accidents.

Hysterical Type.—In only 3 men of this series hysterical characteristics or symptoms preceded the onset of psoriasis.

LIFE-SITUATION AT ONSET

Of the 72 patients whose previous personality could be made out with reasonable accuracy, emotional factors played a relevant part in the ætiology of the disorder probably in 29 and possibly in 20. No such evidence could be found in the remainder. Relevance was regarded as probable when events preceding the onset of the disorder stirred up emotional conflicts to which the individual's mind had been specifically sensitised, and as possible when the onset occurred during periods of emotional tension not immediately related to problems and conflicts specific for the personality affected—i.e., if the possibility of an accidental coincidence, in contrast to a causal coincidence, could not be safely excluded.

TABLE II—EMOTIONAL FACTORS OPERATIVE IN ÆTIOLOGY

Personality	Probably	Possibly	No evidence	Total
Well or fairly well adjusted	1	6	22	29
Maladjusted or psychiatrically ill	28	14	1	43

Table II shows that not in every case of the maladjusted group could an ætiological connexion between the emotional maladjustment and the onset of the psoriasis be established, whereas in some patients classed as previously well adjusted emotional factors apparently played a relevant part in the ætiology of the disorder.

The following examples illustrate the mode of onset in relation to the previous personality. They are selected from the groups of cases in which evidence of ætiological relevance was regarded as probable and are arranged according to the personality types described above.

Compulsive Type.—A lance-bombardier, aged 30, was a little man. On examination he dictated (in both senses of the word) rather than spoke about himself in a free and easy manner. In doing so he got lost in minute irrelevant details. He was dead serious and could not be made to smile.

The keynote of his life had always been work. Originally he was driven by his nagging father, afterwards by his severe conscience. His aim had always been security, early retirement, and leisure. But somehow, however hard he tried, he could never relax; if he had nothing to do, he found something to keep himself busy. Paying meticulous attention to detail, he worked until he was completely exhausted. He never allowed himself any pleasures and was devoid of any joie de vivre. "Ninety per cent. of the time I feel low and depressed," he said. If he was left alone, he seemed to be an extremely competent worker; but, if he had to work in a hurry, or if a superior was present, he became flustered; and, if several demands were made on him at the same time, or if he did not feel equal to the task, he lost his head altogether.

"When I was 21, I took on a job as accountant for three companies, and I felt that, because of my age, this was too much for me. About a week after I had taken on the job, the psoriasis started. However, I persevered and was determined that I should not let the job beat me. In a matter of six weeks the psoriasis cleared. The reason why it cleared was that I settled down to the job, and it did not worry me any more.

"After that I was only troubled with a very small patch periodically when I had exceptional worries.

"When I came into the Army I was worried about being regimented and everything I had to do. The whole day long I was anxious about whether I was doing something which I should not be doing, or whether I was failing to do something which I should be doing. That strain caused me loss of sleep. In fact, during the daytime quite often I felt half in a stupor, and at times my mind seemed very bewildered." He had a severe relapse 3–4 weeks after his enlistment.

Over-aggressive and Unaggressive Types.—(1) *Over-aggressive:* A private, aged 22, had always been up in arms against authority. On examination he was definitely nervous. He was sweating profusely during the interview and smoked one cigarette after another.

He was the son of a man previously in a position of authority, an unfortunate individual who tried to educate his children by deriding their unsuccessful efforts. As a child the patient was self-willed and unmanageable; afterwards, in contact with superiors, he was either frankly stubborn and argumentative or terrified. Boxing was his favourite hobby.

He joined the Army five months ago. His enlistment greatly intensified his conflict over authority. In keeping with his previous behaviour, he was either troublesome or anxious during training. Since his enlistment he had developed well-marked anxiety symptoms. His psoriasis started three months after he had joined up.

(2) *Unaggressive:* A private, aged 32, a woman refined in caste and mimosa-like in her nature, had not known that she was of illegitimate birth until she was 16 years old. A

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woman whom the patient believed to be her mother had taken care of her when the patient was a baby. This foster-mother, though generous in many ways, was very possessive and domineering. Feebly protesting the patient bowed to her foster-mother's continual pleasure-denying demands. Even as a schoolgirl she shunned other girls' company because she felt unworthy of it. For reasons unknown to her she had always felt unwanted and in the way. She had always craved for affection but, partly owing to her foster-mother's possessive attitude and partly as a result of her self-imposed isolation, she has never been able to obtain it.

When the patient was 16 years old, her foster-mother revealed to her the carefully kept secret of her birth. This revelation greatly intensified the patient's feelings of inferiority. She then had a nervous breakdown, during which she developed the first symptoms of psoriasis.

Since then she had had three relapses: one when her foster-mother had a stroke; the second when against her foster-mother's wishes the patient, with severe pangs of conscience, volunteered for the A.T.S.; and the third when her application for a compassionate home posting, made under pressure by her foster-mother, had been granted.

(3) *Ambivalent:* A private, aged 19, had always been intensely ambitious. Most children have their squabbles, friendly and sometimes not so friendly, with their brothers and sisters; but in his case it was different. Although he and his brother were inseparable and to all appearances the best of friends, there was a rivalry between them, and there was something vicious about it. The patient did not like it a bit that certain privileges were granted to his older brother.

When the patient was 12 years old, his brother sustained an accidental head injury and had to go to hospital with meningitis.

"I was very upset when he had to go to hospital, and during that time I was rather jumpy and, when I heard that he was dead, I was ill. I was kind of sick with the thought of losing him. It upset my inside. I would not eat and I was sick. It made me homely, I would not go out. After a short time had elapsed, I found that the skin trouble was breaking out on me."

Bisexual Type.—A private, aged 29, was the daughter of a time-serving soldier. She had always greatly admired her father; talking about her mother she dismissed her as "a talkative scatterbrain child married to a grown-up silent man." The patient was masculine in appearance. Her voice was low-pitched, and her manner of speech was more that of an old soldier than that of a member of the fair sex. She used make-up and, as the conversation drew on, she displayed some feminine charm.

She was a very clear and logical thinker and had a remarkable insight into her emotional difficulties. She realised that she struggled a good deal inwardly. There were two totally different personalities in herself, one masculine and the other feminine. She watched these two personalities like an unconcerned observer and tried to laugh at them. The masculine side of her was a soldier—like her father, hard and harsh—the feminine side longed for affection—alas, in vain—and delighted in feminine pursuits. She loved to talk to soldiers for hours about the Army and found great pleasure in all domestic arts. She had always been a woman-hater and was sexually frigid.

At the age of 18 she chose to become a nurse in a children's hospital. The work was strenuous but, more important than this, to work in a female community proved irritating to her. Soon afterwards she developed a patch of psoriasis, which regularly disappeared when she went on holiday and came back each time she returned to duty. Eventually after two years she gave up this job and was free from psoriasis, until in 1941 she volunteered for the Army. Enlistment presented an emotional strain to her on three counts: life in a female community did not agree with her; she "wanted to be a soldier and not an A.T.S. girl"; and her aspiration to become an officer was not fulfilled.

Phobic Type.—A sapper, aged 35, was a big-built red-cheeked man, a picture of health. His account was incoherent. He appeared tense, anxious, and puzzled.

His mother had died when he was 5 years old. At the age of 8, roughly coinciding with his father's second marriage, he had a nervous breakdown. His stepmother was a brutal woman, dirty in her habits. Before his recent breakdown he was a quiet solitary individual, very conscientious at work and prone to worry unduly. He had always been unusually fussy about cleanliness and had always had a morbid fear of infection and of enclosed spaces.

In February, 1943, he was taken prisoner. "Life in the camp was horrible. There was so much filth in it—lice, bugs, and fleas. It somehow got on my nerves." To live behind barbed wire was unbearable for him. In what obviously amounted to a phobic panic he escaped from the camp. He then joined Italian partisans and lived with them for sixteen months under conditions of great hardship. During this period his anxiety state became worse. He now suffered from sleeplessness, restlessness, irritability, deficient memory, and inability to concentrate. His psoriasis started in the prison camp.

Hysterical Type.—A gunner, aged 19, was not much of a soldier. He had only been twelve months in the Army and had hankered all the time for his mother's flesh-pots and her loving care. What made matters worse was that his "Mum" was in poor health, and he worried a good deal about her.

He was the only child of his parents and had been doted on by both of them. In his home village he was a lone wolf, spending most of his spare time in his mother's company. Talking about her he cried bitterly. If a job did not suit him, he simply walked out and went home.

His enlistment was a severe blow for the whole family. But to go overseas was definitely too much for him. His embarkation leave was sad and tearful. On return to his unit he was covered with spots and had to be taken off the draft.

OTHER ÆTIOLOGICAL FACTORS

Heredity.—24 of the patients reported that other members of the family had psoriasis: 7 of the early childhood group of 14, 10 of the well-adjusted group of 29, and 7 of the maladjusted group of 43. In other words, 1 in 2 of the early childhood group, 1 in 3 of the well-adjusted group, and 1 in 6 of the maladjusted group, showed a hereditary predisposition to psoriasis. A similar trend is noticeable regarding age of onset. Evidence of hereditary predisposition was found in 1 in 2 up to the age of 10, in 1 in 4 between the ages of 11 and 20, and in 1 in 6 over the age of 20.

Febrile Diseases.—Psoriasis developed in 6 patients in the course of, or subsequent to, a febrile disease (appendicitis, scarlet fever, diphtheria, measles, trypanosomiasis).

Trauma.—3 patients had their first attack of psoriasis after a serious accident, 2 after an appendix operation, and 1 after an operation for varicose veins (at the site of the operation); 3 patients had been scalded in childhood.

REACTION TO ILLNESS

The social effect of a skin condition such as psoriasis is considerable. To the layman's mind it conjures up venereal disease, dirt, and neglect. Hence the psoriatic soldier, whenever communal life in the Army necessitates undressing in front of others, must expect to be gazed at or to be asked awkward questions: "You are in a hell of a state," his comrades say, and "is it catching?" they want to know. They take care not to touch his kit. Moreover, there may be trouble at home. Marital discord over psoriasis arose over such varying causes as flakes on the nice carpet, bedclothes stained with ointment, and sexual refusal by a wife scared of infection. This state of affairs is even worse if exposed parts of the body are affected. If his hands are affected, his dancing partner may comment on it; and, if he has eruptions on his head, the barber may refuse to cut his hair.

No wonder, therefore, that most psoriasis patients, varying in degree with the area and the site affected and with their personalities, are seriously concerned about their skin complaint. They try to cover it as much as they can. They do not like to put on ointment in the barracks, and they undress at night, if possible in the dark. They dread bath parades and ask to be excused from physical training. They soon give up swimming and sunbathing. Cricket is out of the question, because "you don't like to roll your sleeves up." Gradually they cut themselves off from all sports activities and, in extreme cases, from social activities altogether. "Other people have a clean skin," they say to themselves, "why can't I?"

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If this is their first attack, they may still hope for an improvement; but, if they have suffered from psoriasis for a considerable time or on previous occasions, it may dawn upon them that they will have it for good. They then begin to worry how it may affect their civilian occupation, and whether, "with that," they will ever find a wife. If they are married they wonder whether they will pass it on to their children. A few men comforted themselves with the curious conception that psoriasis is a healthy man's disease.

Cases of very long standing deserve special interest as regards the patient's reaction to illness. Of the 14 patients of the early childhood group 11 made a fairly good adjustment; 3, apparently in relation to their long-lasting skin affection, developed a peculiar schizoid picture with shut-in-ness, extreme shyness in social contacts, paranoid formations, and inability to express their thoughts and feelings as prominent features.

DISCUSSION

Psoriasis is not bound to any one personality type either physically or mentally. The range of personality types encountered in this series covers people as diverse as a burglar at one end of the scale and law-abiding God-fearing citizens at the other.

In 14 of the 86 patients examined psoriasis started in early childhood. Of the remaining 72 patients whose previous personality could be made out with reasonable accuracy, 29 were classed as emotionally well adjusted and 43 as maladjusted. The number of emotionally maladjusted individuals in this series is far in excess of a cross-section of the population and especially of a random sample of soldiers. Of the patients studied 24 reported that other members of the family suffered from psoriasis—1 in 2 of the early childhood group, 1 in 3 of the well-adjusted group, and 1 in 6 of the maladjusted group. Of the 72 patients whose previous personality could be ascertained, emotional factors played a relevant part in the ætiology of the disorder in 29 at the least and in 49 at the most.

It is fascinating to speculate why patients with psoriasis fall ill in the way they do—i.e., to understand the psychological meaning of their complaint. But there is no uniformity of emotional conflict. In the light of our present knowledge one can only state that individuals in whom the hereditary element is very powerful may develop psoriasis in any case, whereas others need a catalyst to mobilise a dormant predisposition to psoriasis. More often than is generally known, emotional crises of a nature specific to the individual affected seem to assume this function. In other words, if an individual is emotionally maladjusted for reasons unrelated to the psoriasis, the emotional maladjustment may, but need not, take charge of the psoriasis and determine its onset and further relapses. The parallel to other conditions, such as allergic manifestations and diabetes mellitus, is obvious.

From the military point of view patients with psoriasis in need of psychiatric care should receive it. Dermatologists sending this random sample were remarkably correct in spotting the "queer" ones among those they submitted. Further, it may be suggested that medical officers should point out in their V.D. lectures that many skin affections are of non-venereal origin and are not contagious. Reassurance to this effect by unit medical officers to the immediate companions of a soldier with chronic psoriasis may alleviate his lot considerably, and similar reassurance given to the patient does much to relieve anxiety.

My thanks are due to Brigadier H. A. Sandiford, director of Army psychiatry, under whose instructions these investigations were carried out; Brigadier R. M. B. MacKenna, for his encouragement and helpful criticism; and the medical and nursing staff of the military hospitals where patients were studied.

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FOOD YEAST IN TROPICAL MALNUTRITION

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FOR many years the lesions of the tongue, lips, and external genitals which we now know to be characteristic of riboflavine deficiency have been recognised and described in most parts of the tropics. Epidemics have been described particularly in jails and institutions in East Africa (Stannus 1912), Malaya (Landor and Pallister 1935), Sierra Leone (Wright 1928), and Nigeria (Moore 1930). Moore found the condition associated with defective vision in school-children. This group of lesions is often the only expression of tropical malnutrition in Nigerian adults, while in kwashiorkor and infantile pellagra they constitute the nucleus of the widespread rash, and there are good reasons for believing that riboflavine deficiency is the basic deficiency in kwashiorkor. The accounts published by Sebrell and Butler (1939) and Sydenstricker (1941) have made the condition easy to recognise, and in 1942 I found that the lesions in Lagos prisoners gave a rapid and specific response to injections of riboflavine. In 1944 a supply of food yeast was put at my disposal by the Colonial Office. It was stated to contain 5 mg. of riboflavine per 100 g. Experience in the African Hospital, Lagos, showed that it was most satisfactory in the treatment of the prevailing type of malnutrition both in children and in adults. The following is an account of some controlled investigations carried out in the local prisons and lunatic asylums to find out how much yeast it would take to eliminate symptoms of deficiency, and how the amount could be incorporated in the food.

MATERIAL AND METHODS

Lagos has two prisons: one for long-term prisoners in Lagos town, and one for short-term prisoners in the suburb of Ikoyi. All the yeast trials on prisoners were carried out in Lagos prison. Food for the two prisons is supplied by one contractor and delivered in bulk at Lagos prison every morning. The asylum is divided into male and female blocks. Cooking arrangements are separate, but the food for both asylums is supplied by the same contractor. There is no point in giving the dietary schedules, because I could not check deliveries personally. This is not to say or imply that the scheduled quantities of food were not delivered. It would need the most intensive investigation to find out whether they were consumed or not. Even to attempt such an investigation would defeat its own object, and I avoided the necessity for it by treating small batches at a time and by establishing controls at every step.

At examination the male prisoners were stripped and examined in a good light, and all lesions suggesting deficiency were noted. For purposes of recording, only three crude and easily recognisable lesions of riboflavine deficiency are taken into account: (1) glossitis; (2) cheilosis, which includes redness of the lips beyond the margin of closure and angular stomatitis; and (3)

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exfoliative dermatitis of the male external genitals. Only the tongue and exposed parts of the body were examined in females. In all the tables describing the results with food yeast the lesions are classified as mild, severe, or absent.

I have examined the total population of Lagos prison for signs of deficiency at intervals during the years 1943–45. The results of examination are summarised in table I.

TABLE I—RIBOFLAVINE DEFICIENCY IN LAGOS PRISONERS

—	Date of examination						
	1943			1944			1945
	April	Sept.	Nov.	July	Sept.	Nov.	Jan.
No. examined	146	308	345	342	338	332	318
Deficient ..	47	65	34	102	130	80	84
Percentage deficient ..	32·2	21·1	9·9	29·8	38·0	24·0	26·4

During September–October, 1943, the method of cooking the green leaves was changed. This may explain the drop in the incidence of deficiency in November, 1943. The change in the cooking method proved so unpopular that it had to be discontinued in December, 1943.

In all the trials the yeast was stirred into the soup after cooking; the soup was then divided up and poured on the portion of cooked staple—yam or "gari" (cassava flour). This was done under my personal supervision unless otherwise indicated. Routine duties prevented me from observing the actual consumption of the meal. The prisoners were locked in their cells as soon as they had received the food; hence there were very few opportunities for evasion. Among the lunatics, as might be expected, consumption was not nearly so uniform. Some of the inmates with tuberculosis or dysentery, for example, could not be expected to consume their ration, and a few negativistic lunatics resented interference with their diet. This must be allowed for in assessing the results.

TABLE II—EFFECT OF FOOD YEAST SUPPLEMENTS (8 G. DAILY FROM NOV. 17, 1944, TO JAN. 2, 1945) ON INCIDENCE OF RIBOFLAVINE DEFICIENCY IN LAGOS LUNATICS

Date of examination	Treated (males)		Controls (females)	
	Nov. 17, 1944	Jan. 2, 1945	Nov. 14, 1944	Jan. 4, 1945
Number examined	145	145	68	66
Severe lesions ..	22	2	5	11
Mild lesions ..	23	16	20	14
No lesions ..	100	127	43	41

RESULTS

Lunatic Asylum, Lagos: 8 g. of Food Yeast Supplement Daily.—The total amount (1120 g.) was added to the soup for the men at the evening meal, a dummy powder being added to the soup for the women. I supervised the addition on all except a few occasions. The experiment began on Nov. 17, 1944, and lasted till Jan. 2, 1945. The results are summarised in table II.

A new food-contractor was appointed for 1945, and, since this introduced a variable which might be difficult to assess, I discontinued the trial on Jan. 2, 1945. On the male side there were 3 deaths during the trial. There were 5 admissions and 2 discharges. Of 6 œdematous subjects at the beginning of the trial 2 lost their œdema; of the remaining 4, 1 died during the trial and the other 3 soon afterwards. Full investigation of the cause of the œdema was not possible, but in 1 case it was associated with tuberculous spine and in 2 of the others with diarrhœa. The effect of the yeast on the œdema could not be assessed. On the female side there were 1 death, 1 admission, and 2 discharges.

Although, as already stated, the consumption of yeast was not uniform, the general results of this field trial were very satisfactory. If we had continued with this supplement of food yeast, I think all symptoms would have disappeared within another month.

Lagos Prison: 4 g. of Food Yeast Supplement Daily.—A batch of 18 prisoners, all with signs of deficiency, were chosen and put into a small block by themselves. Every day 4 g. of food yeast was added to the morning soup after cooking. As controls, another batch of 14 deficient prisoners were observed, and I also examined the total population of the prison before and after the trial. The incidence of deficiency symptoms in the latter showed no variation which could not be explained by the turnover in admission and discharges and individual treatment during the experiment. The experiment began on Nov. 30, 1944, and lasted till Jan. 5, 1945. The results are summarised in table III.

TABLE III—EFFECT OF FOOD YEAST SUPPLEMENTS (4 G. DAILY FROM NOV. 30, 1944, TO JAN. 5, 1945) ON INCIDENCE OF RIBOFLAVINE DEFICIENCY IN 18 LAGOS PRISONERS

Date of examination	Treated (total 18)			Controls (total 14)	
	Nov. 30, 1944	Jan. 5, 1945	Jan. 26, 1945	Nov. 30, 1944	Jan. 5, 1945
Severe lesions	18	1	5	7	7
Mild lesions ..	Nil	4	6	6	4
No lesions ..	Nil	13	7	1	3

The results suggested that 4 g. of food yeast was not quite sufficient to supply the deficiency, and re-examination three weeks after stopping the yeast (Jan. 26, 1945) showed 5 severe relapses among the treated group.

Lagos Prison: 9 g. of Food Yeast Supplement Daily.—The total population of one block (118 prisoners, of whom 64 had signs of deficiency) were put on 9 g. of food yeast daily. An amount equivalent to 4·5 g. each was added to the soup twice daily. On most days I supervised the addition of the yeast to both meals, and on all but four days I saw the yeast being added to the soup for one meal. As controls, 16 cases of deficiency among the remaining prisoners were observed during the trial. The trial began on Jan. 22, 1945, and lasted till March 16, 1945. The results are summarised in table IV.

No prisoner in the treated group developed fresh lesions. Among the controls there was some deterioration, and 2 of the severe cases had to be treated. Both were given 10 mg. of riboflavine by injection, after which their lesions disappeared within a week and relapsed within six weeks.

TABLE IV—EFFECT OF FOOD YEAST SUPPLEMENTS (9 G. DAILY FROM JAN. 22 TO MARCH 16, 1945) ON INCIDENCE OF RIBOFLAVINE DEFICIENCY IN LAGOS PRISONERS

Date of examination	Treated		Controls	
	Jan. 22, 1945	March 16, 1945	Jan. 22, 1945	March 16, 1945
Number examined	118	115*	16	16
Severe lesions ..	29	3	7	12
Mild lesions ..	35	5	9	4
No lesions ..	54	107	Nil	Nil

* Three prisoners were discharged; none of these had lesions at any time.

The 8 prisoners whose lesions had not healed at the end of the trial were divided into two equal groups, one of which was given a single dose of 10 mg. of riboflavine by injection, and the other put on 10 g. of yeast daily. I injected the riboflavine myself and as often as I could

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afford the time I arranged that the prisoners swallowed the yeast in my presence. All but 1 of the riboflavine group cleared up within ten days and all but 1 of the yeast group within four weeks. Of the remaining 2 cases, 1 was a case of "geographical" tongue of unknown ætiology. Although such cases are not uncommon, it takes a wide experience and careful examination to distinguish them from the patchy glossitis often seen in riboflavine deficiency. They are not syphilitic. The condition proved refractory to food yeast and to riboflavine and nicotinic acid by mouth and by injection. The second case was an old man with glossitis, cheilosis, and scrotal dermatitis of long duration. The tongue was deeply fissured and had a pebbled appearance in front, due to the warty overgrowth of the papillæ. Large dosage of yeast and riboflavine had little or no effect on the tongue, although the other lesions had already cleared before the end of the trial period. The anatomical changes in the tongue appear to be irreversible in such long-standing cases.

It was arranged that the prisoners should have a special remission for good behaviour and coöperation during the experiment. This promise of reward, together with as much personal supervision and checking as I could afford, kept evasion down to a minimum. A few unregenerates—less than 6, I believe—succeeded in dodging some of the meals. One deficient prisoner, who managed to evade the diet until near the end of the trial, was working as a hospital attendant. I had not realised that his occupation would provide him with such opportunities for evasion. I am satisfied that these few evasions did not seriously affect the results of the trial.

The prisoners' reception of the food yeast was on the whole most satisfactory. Only 2 of them made formal complaints: 1 of stomach-ache and 1 of diarrhœa. Some of the prisoners said the yeast gave "body" to the soup and asked for it to be continued after the trial had ended.

DEFICIENCY IN NEW ADMISSIONS TO LAGOS PRISON

From the beginning of July, 1944, to July, 1945, all new admissions to prison were examined for signs of deficiency. The examination was carried out on one day each week, all being examined before they had been in prison for a week. A total of 1372 new admissions examined in this way showed 218 (15·9%) with signs of deficiency.

DISCUSSION

Although we cannot work out an exact correlation between the dietary deficiency and the incidence and severity of symptoms, we can get an approximate idea of the daily supplement necessary for the general population from the above results.

One of the most confusing findings is the fact that in subjects kept on the same deficient diet and observed over a period of years there are enormous variations in clinical signs of deficiency. This has been noted particularly in the prisons where some prisoners have been observed to retain their symptoms for more than two years while others remain symptom-free. This irregular incidence is due, no doubt, to "refection" of a kind—i.e., the synthesis and absorption of vitamins in the gut. The first trial in the prison showed that although a 4 g. daily supplement of food yeast could cure an occasional severe case in a population with a 24% incidence of deficiency symptoms it would not cure all cases. A supplement of 9 g., however, produced cure in all cases when the incidence was much the same (26·4%). A supplement of 10 g. should be effective in the social class from which the new admissions (incidence 15·9%) derived if the diet consumed by that class was reasonably uniform. From what we know of the local diet and the direction in which it shrinks with contraction of the family income, I think a 10 g. supplement should be sufficient to cover all but the most extreme cases of poverty. Our experience with inpatients and outpatients at the African Hospital, Lagos, confirms this estimate. The adverse circumstances which determine the incidence of deficiency symptoms in these cases were identified most commonly as poverty, wasting disease (particularly tuberculosis and the dysenteries), pregnancy, and lactation. A dosage of two teaspoonfuls of yeast daily for adults and children appears to be quite satisfactory. This amount added to the soup for convalescent cases of kwashiorkor has given excellent results.

For the general population a supplement of this size can easily be incorporated in the diet—a teaspoonful in the soup at each of the two principal meals. The cost will be about ¼*d.* a day. This places it well within the reach of even the poorest classes.

The work of Fitzgerald Moore has popularised yeast in Southern Nigeria, and requests for yeast or 'Marmite' are frequent in all outpatient departments. Of all the medicines dispensed to outpatients I believe that yeast is the one most consumed.

Most of the symptoms of tropical malnutrition in Africa belong to that group referred to as "pellagroid." The group as a whole responds to treatment with vitamin-B_2-complex preparations (yeast, crude liver extract, and marmite), but it is not possible to refer every lesion and symptom to its appropriate missing factor in the complex. The most outstanding and characteristic set of lesions in this pellagroid group are those associated with riboflavine deficiency, and these can be covered by 10 g. of food yeast daily. Before the isolation of riboflavine and nicotinic acid the dosage of yeast recommended for pellagra was up to 2 oz. daily. In recommending 10 g. of food yeast for the prevention of our local malnutrition, I have discounted the value of the protein in the yeast. This is not to say, of course, that a large quantity of protein in the diet would not be most acceptable. Nor is it suggested that food yeast is the final solution of the nutritional problem. A liberal supply of milk and dairy produce would be desirable additions to the native diet; but they are not obtainable, and the prevalence of trypanosomiasis among cattle makes it unlikely that they will be obtainable in Africa for many years. To recommend a higher dosage of yeast will involve new questions of cost and supply, and alternative methods of incorporating it in the diet will have to be devised. The supplement of 10 g. daily has the advantage of being sufficient for prevention without seriously interfering with the cost or make-up of the diet or the methods of cooking.

It may be considered by some that the margin of riboflavine (0·5 mg.) in the supplement is too low; that it does not allow for the erratic consumption we must expect among the general population. A recent statement by the manufacturers of food yeast (Colonial Food Yeast Ltd. 1944) should ease any doubts on this point. They claim to have already isolated a strain of *Torulopsis utilis* capable of producing 9 mg. of riboflavine per 100 g. of the finished product. This doubles our margin of safety—and the development of food yeast is still only in its infancy.

SUMMARY

Riboflavine deficiency is the outstanding clinical manifestation of tropical malnutrition in Lagos.

Controlled experiments in the local prison and asylum show that a supplement of 9 g. of food yeast daily would eliminate the deficiency.

A supplement of 10 g. of food yeast daily is recommended for the local population. This amount can be incorporated in the diet without offending local prejudice or cooking customs. It will cost about ¼*d.* a day, which is well within the means of the poorest classes.

I am indebted to Dr. B. S. Platt for his help in securing a supply of food yeast, and to the D.M.S., Nigeria, for permission to publish.

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FUNICULITIS
IN BRITISH TROOPS IN CEYLON

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AFTER the onset of the 1943 south-west monsoon in Ceylon there was an outbreak among the British troops of what, for want of a better name, may be called funiculitis.

ILLUSTRATIVE CASE-RECORDS

The following cases are typical of many others.

CASE 1.—An officer, aged 31, complained of pain starting in the left groin 14 days earlier and then shifting to the left testicle. There were no urinary symptoms and no history of infection of any kind. On examination the left half of the scrotum right up to the external ring looked redder, smoother, and fuller than the other half. This was due to congestion and mild œdema of the skin and to enlargement of the underlying structures. The cord, traced from above downwards, felt thicker than its companion, but it was not until its lower end was reached that anything startling was discovered. Here, in its substance, just above the caput major of the epididymis, was a swelling which, though slightly tender, could easily be defined. It was about the size of a walnut, irregular in outline, and hard. There was a little fluid in the tunica vaginalis. Testis, epididymis, and vas were normal, and so were the prostate and vesiculæ, as far as rectal palpation could tell. A specimen of urine contained a few cells, but the *Staphylococcus albus* cultured from it was probably due to contamination.

When first seen the patient had slight pyrexia, but this quickly subsided, and so did his pain, which was at no time very troublesome. The physical signs disappeared in a fortnight, all but the swelling at the lower end of the cord. This too diminished considerably but at the end of 9 weeks was still represented by a nodule the size of a pea.

CASE 2.— A sergeant, aged 26, had pain and swelling in the genitalia which he attributed to an injury in the preceding week. The connexion seemed doubtful. He had no urinary symptoms and gave no history of infection. On inspection it was at once obvious that the trouble was on the right side, but, owing to the presence of a small hydrocele, no physical signs more suggestive than a slight fullness and tenderness of the spermatic cord could be demonstrated. The symptoms became more marked, and he was admitted to hospital, where the hydrocele was tapped. Testis, epididymis, and vas were normal, but an indurated cord with two or three nodularities along its course could be felt lying parallel to the epididymis. It was by no means as obvious as the swelling in case 1, but was easily palpable. Prostate and vesicles were unaffected. The fluid drawn off the hydrocele and the urine did not disclose anything of significance.

This patient never had a rise in temperature, but he took rather longer to clear than case 1. The general fullness slowly diminished, and the indurated cord resolved. At the end of 9 weeks the only abnormality left was a certain thickening in the caput major of the epididymis as compared with the body or the caput minor.

CASE 3.—A corporal, aged 32, reported sick with a swelling in the scrotum and mentioned a similar attack 2 months earlier. He gave no history of urinary symptoms or of any infection. It was clear, after evacuation of a small left hydrocele, that this patient had a condition similar to that of the other two. There was an indurated mass in the cord where it joined the epididymis. This mass was not quite so large as that found in case 1. The lower part of the epididymis, the testes, and vas were normal, as were the prostate and vesiculæ. Neither urine nor hydrocele fluid presented anything out of the ordinary on microscopy or culture.

Seven weeks later there was still fluid in the tunica (in all the cases the fluid accumulated again after tapping) and still an area of induration above the epididymis, though this was diminishing.

CASE 4.—A corporal, aged 37, felt severe pain in the right testicle and groin 3 weeks before admission. It laid him up and kept him awake at night to begin with but later eased off without going completely. At the onset the testicle was swollen besides being painful. He had no trouble with his water and no venereal history. In this case there were no physical signs obvious to inspection, but on palpation the cord on the affected side was full, although not indurated, the vas was thickened, and the caput minor of the epididymis was enlarged to three or four times its usual size and considerably hardened without loss of its smooth contour. The tunica vaginalis was empty; hence these changes could be appreciated at once. Prostate and vesiculæ were unaltered. The urine was normal.

The fact that this patient's epididymis was involved probably explains the severity of his earlier pain. It was still in the condition described after a month.

DISCUSSION

The striking thing about this condition from a clinical point of view is the localised induration in the spermatic cord. It is due to a thrombosis in the veins. I have seen in the museum of the Colombo medical college specimens which leave no doubt that this is the correct explanation. One showed a twisted mass of veins, representing the whole pampiniform plexus, full of organised clot from end to end. There were other specimens, taken post mortem from cases of a fulminating type, in which all the structures of the cord were involved in a suppurative or even gangrenous process. Records show that streptococci were isolated from the pus and from the blood-stream in these virulent infections.

None of my cases caused a moment's anxiety. If seen at the onset, they were given a few days in bed; if later, they were told to wear a suspensory bandage and carry on with their duties. In only 2 cases out of scores was there gross pathology in any structure other than the veins. One was case 4. In the other the vas alone was affected. For a week or more it was thickened and stiffened, so that one's fingers picked it out at once from the other contents of the scrotum. Later it returned to normal. No accompanying thrombosis was recognisable, but all the other features of funiculitis—redness and œdema of the skin, fullness of the cord, and small hydrocele—were present.

Ætiology.—The ætiology is obscure. A condition of the kind, endemic and seasonally epidemic in Ceylon, at once raises a suspicion of filariasis. But filariasis is uncommon among Europeans, and the neighbourhood from which these cases came is non-filarial. None of them developed an eosinophilia. Filariæ were not found in the blood or in the hydrocele fluid, and the pathology was not of the filarial type.

It is difficult to imagine why what is presumably a blood-stream infection should pick out the genitalia and particularly the venous drainage of the genitalia. If the left side were consistently selected, the prevalence of left varicocele in the age-group concerned might offer a partial explanation, but there was no tendency for one side to be affected more than the other. The level of the lesion was constant—always among the lower anastomoses of the plexus. Thrombosis in an ordinary varicocele differs from the syndrome described: it is not associated with skin changes or with the early appearance of a hydrocele. This suggests, and the 2 cases in which the vas was affected confirm the fact, that funiculitis is a more generalised process than a simple thrombosis. The thrombosis is only one feature, although perhaps the most impressive.

Diagnosis.—During an outbreak like the recent one on the Island mistakes are unlikely to remain uncorrected

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for very long, but with sporadic cases confusion with acute epididymitis in the early stages and with tuberculous epididymitis a little later is a possibility. In the thrombotic group acute epididymitis can be excluded by the absence of urethritis or *Bact. coli* infection of the urinary tract, by the mildness of the discomfort and tenderness, and by recognising that the lesion is not in the epididymis though it may be very close to it. If there is persistent doubt on this last point, it may be overcome by tapping the hydrocele or waiting a few days until the diffuse swelling has subsided.

It is after this interval and possibly long after that a second error can arise. An indurated nodule in intimate relation to the epididymis may easily be mistaken for a tuberculous deposit therein or a hard and nodular vein may be regarded as a "beaded" vas. Here again careful palpation should keep the examiner on the right track. The vas, unless it is diseased, can always be picked away from the swelling between the finger and thumb and its integrity established.

In the other group, in which the vas and epididymis are concerned, differentiation during the acute phase is difficult if not impossible. Case 4, seen by me 3 weeks from the onset, was past this phase, and the swelling in the caput minor of his epididymis was not a bit like a tuberculoma.

SUMMARY

A description is given of an outbreak in Ceylon of cases of thrombosis of the veins accompanying the spermatic cord, usually without affecting any other structures. Illustrative case-records are given.

The most striking clinical feature was induration of the cord.

There was no significant association with pyrexia and usually no sign of infection of the urinary tract.

Patients seen at the onset were given a few days' rest in bed. Those seen at a later stage were told to wear a suspensory bandage and carry on with their duties.

This note is written in the hope that it may be of service to M.O.s serving in Equatorial Africa, Southern India, and Ceylon, where funiculitis is endemic, or to those at home called upon to deal with troops returning from these countries.

I wish to thank Colonel J. L. Lovibond, R.A.M.C., and the Army authorities for permission to publish, and Major Milroy Paul, of the Ceylon Medical Corps, who has given me valuable information about the condition.

PARASCHMITZ DYSENTERY IN WEST AFRICA

N. H. MARTIN

B.M. Oxfd, M.R.C.P., F.R.I.C.

LATE PATHOLOGIST I/C LABORATORIES IN A MILITARY HOSPITAL

A BODY of evidence has been accumulating to suggest that there exist organisms of the non-mannite-fermenting group allied to, but antigenically distinct from, *B. dysenteriæ* Schmitz, which are responsible for outbreaks of dysentery among human beings. Most of the reports have come from India, the Middle East, and the Mediterranean littoral (Archer 1933, Large 1934, Sachs 1943, Christensen and Gowen 1944, MacLennan 1945). This is believed to be the first record establishing their existence in West Africa.

In January, 1943, two officers were admitted to hospital, within 24 hours of each other, with typical attacks of acute dysentery. One had had nine motions in the previous 12 hours, and the other twelve in the previous 20 hours. Blood films, taken as a routine on admission, were searched and no malarial parasites found. The motions, which were typical of a bacillary dysentery, contained blood, pus, mucus, and epithelial debris, but no entamœbæ or ova. On culture a non-lactose-non-mannite-fermenting organism was isolated from the stools of both patients. From one this organism was obtained in almost pure growth on the plate; from the other it was obtained in abundance.

TABLE I—BIOCHEMICAL BEHAVIOUR COMPARED WITH STOCK LABORATORY STRAINS OF *B. dysenteriæ* SCHMITZ AND Q902

Organism	Glucose	Lactose	Mannite	Sucrose	Dulcitol	Arabinose	Maltose	Indole
R.R. ..	A 1	−10	−10	−10	Alk 2	A 2	−10	+
G.L.W. ..	A 1	−10	−10	−10	Alk 2	A 1	−10	+
1057A ..	A 1	−10	−10	−10	..	A 2	−10	+
Schmitz ..	A 1	−10	−10	−10	..	A 2	−10	+
Q902 ..	A 1	−10	−10	−10	Alk 2	A 2	−10	+

Numeral refers to days to produce acid or before completion of test.

It was noted that these organisms did not agglutinate with the stock antisera for Schmitz or for Shiga. Nor did they agglutinate specific antisera for the Newcastle Manchester 88 group. Though the attacks proved mild, both patients making an uninterrupted recovery, interest was aroused. It was known that the two officers shared the same quarters, and that the native who served them both had in the last few days returned from a visit to relations living in the Northern Territories. On his return he had mentioned that he did not feel well, but had made no specific complaints nor asked to be excused duty.

TABLE II—SEROLOGICAL BEHAVIOUR AGAINST ANTISERA FROM OXFORD AND THE ARMY VACCINE LABORATORY, AND AGAINST ANTISERA PRODUCED IN RABBITS LOCALLY AGAINST ORGANISM R.R. AND THE STOCK STRAIN Q902

Organism	Schmitz antisera		Q902 antisera titre 1 : 400	R.R. antisera titre 1 : 400
	Oxford titre 1 : 250	Army Vaccine Laboratory titre 1 : 125		
R.R. ..	−1 : 5	−1 : 5	+1 : 400	+1 : 400
G.L.W. ..	−1 : 5	−1 : 5	+1 : 400	+1 : 400
1057A ..	−1 : 5	−1 : 5	+1 : 400	+1 : 400
Schmitz	+1 : 250	+1 : 125	−1 : 5	−1 : 5
Q902 ..	−1 : 5	−1 : 5	+1 : 400	+1 : 400

A specimen of fæces obtained from the servant was watery and contained pus, blood, and occasional flakes of mucus. On microscopical examination, four ankylostome ova were seen, but no entamœbæ. From a culture on desoxycholate medium an organism was isolated resembling that obtained from the two patients. The servant admitted that he had been suffering from "belly palaver" recently, but that he was now feeling much better and quite fit to do his work. He seemed most anxious not to lose his job and ascribed his illness to bad food he had eaten while on holiday.

The other servants in the mess were examined, but we did not recover the organism from any of them. No other European had recently had dysentery in that mess.

Investigation of Organism.—It was a gram-negative bacillus. Subcultured on MacConkey's agar the colonies were small, discrete, smooth, and almost transparent, having a bluish tinge. On 1·5% agar there was no tendency to swarm, the colonies remaining discrete, and in broth the organism was non-motile. Its biochemical and serological behaviour and results of cross-absorption tests are given in tables I–III.

TABLE III—CROSS-ABSORPTION TESTS WITH Q902

Serum			Q902	R.R.	G.L.W.
R.R. control			1 : 200	1 : 200	1 : 200
Q902 control			1 : 200	1 : 200	1 : 200
R.R. absorbed with suspension of	Q902 ..		Nil	Nil	Nil
Q902 absorbed with suspension of	R.R. ..		Nil	Nil	Nil

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Patient's serum-agglutination reaction to organism isolated;

R.R. ..	1 : 50, 6th day	1 : 100, 9th day.
G.L.W. ..	1 : 25, 7th day	1 : 50, 10th day.
1057A ..	1 : 50, 5th–6th day.	

Organisms isolated from fæces:

R.R. on the 1st, 2nd, and 4th days of disease but not thereafter.
G.L.W. on 2nd and 3rd days of the disease but not thereafter.
1057A on the 5th–6th day of the disease but not thereafter.

No other pathogen was isolated from any of these stools at any time during the investigation.

DISCUSSION

There seems no reasonable doubt that the organism isolated from these persons was of the same group as that described in India under the heading Q902 (Large 1934) and recorded from the Middle East (Sachs 1943, MacLennan 1945). As Boyd (1940) has commented, the satisfaction of Koch's postulates is no easy matter when dealing with the dysenteries. Nevertheless, it does seem reasonable to suppose that in these three persons the organism isolated was the cause of the attacks of dysentery. During the period 1942–44 some 600 specimens were examined from dysentery patients, and only in one other specimen—from a European female—was the organism isolated. For various reasons we were unable to examine her contacts. In 2000 routine examinations of native food-handlers the organism was never recovered.

The camel routes which run across the Sahara and its fringes from the Mediterranean littoral and the Nile valley into Sokoto and Kano in Northern Nigeria and the Northern Territories of the Gold Coast are probably the oldest-established links between West Africa and the outside world. These in their turn link up with the great trade routes running up to Damascus and Aleppo, even to Bagdad and Ispahan. Is it too far-fetched to think that the traders from the Middle East and beyond have planted this strain in West Africa, a memorial to one of their many activities there?

My thanks a redue to Lieut.-Colonel G.T.L. Archer, R.A.M.C., for the culture of Q902; Captain J. B. Mitchell, R.A.M.C., for the clinical notes; and Prof. B. G. Maegraith, who encouraged me to study the dysentery-producing organisms on the West Coast.

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Preliminary Communication

FAT-ABSORPTION IN TROPICAL SPRUE

As Stannus (1942) has pointed out, information on fat-absorption in sprue has mainly been derived by inference from percentage estimations of fat done on isolated stool specimens, a method which is unsatisfactory because it takes no account of variation in both the fatty and non-fatty constituents of different stools on uncontrolled diets. In this communication we summarise the results of fat-balance experiments intended to amplify knowledge of fat-absorption in early cases of tropical sprue.

All the patients investigated had steatorrhœa and had lost weight; glossitis and moderate macrocytic anæmia were common but not universal. Stools were collected in 3-day or 4-day periods from patients on a diet of known fat-content, in most cases 69 g. or 96 g. of fat a day. Successive periods showed considerable variation, and the conclusions set out here are based on 12-day periods. The percentage fat-absorption was given by the expression

$$\frac{(\text{dietary fat} - \text{excreted fat}) \times 100}{\text{dietary fat}}.$$

In nineteen untreated patients with moderate to extremely severe sprue, but with formed stools, the percentage fat-absorption was very variable (average 75·6%; range 51–85%). These figures do not include three patients with watery diarrhœa, in whom fat-absorption at the relevant time averaged 30, 55, and 64%. These results are in good agreement with the general statement of Wintrobe (1942) that 44–89% of the ingested fat is absorbed. A change in the fat-content of the diet from 69 g. to 96 g. a day in five patients was attended by an increase in the total excretion of fat, but the proportion of fat absorbed remained substantially the same in two patients, rose slightly in one, and fell slightly in two (table I). Thus there is no real evidence that a moderate increase in the dietary fat lowers the percentage fat-absorption. Wintrobe (1942) maintains that a very low dietary intake of fat prevents steatorrhœa. This was confirmed in two patients; on a diet containing 6 g. of fat a day their fat-excretion was within normal limits and differed little from that of two normal subjects on the same diet (table II).

TABLE I—PERCENTAGE FAT-ABSORPTION ON DIETS OF DIFFERENT FAT-CONTENT

Patient	Fat-absorption (% of intake)	
	Diet with 69 g. of fat a day	Diet with 96 g. of fat a day
1	82	83
2	80	74
3	83	88
4	85	87
5	51	44

TABLE II—FAT-EXCRETION IN CARMINE-MARKED 3-DAY PERIODS ON A VERY LOW FAT DIET

Subject	Period			
	One	Two	Three	Four
Sprue A ..	41	5·6	6·5	32
Sprue B ..	75	23	7·3	63
Normal A ..	15	18	6·1	16
Normal B ..	21	26	4·2	12

All the figures represent the total fat-excretion in g. per 3 days. In periods one and four the diet contained 96 g. of fat a day; in periods two and three 6 g. of fat a day. The high fat values for 3 of the subjects in period two are presumably due to "carry-over" of stool from period one, in spite of marking.

In collaboration with Lieut.-Colonel K. D. Keele and Captain J. B. Bound, we have observed the effect on fat-absorption of treatment with liver extract, nicotinic acid, riboflavine, pantothenic acid, and yeast extract. Nicotinic acid, riboflavine, and pantothenic acid did not improve fat-absorption. The liver extract used was 'T.C.F.,' an Indian preparation stated to contain "most of the B-complex substances present in the original liver." In a dosage which relieved all clinical symptoms, and caused the mouth and tongue lesions to disappear and the weight to become normal, this extract did not improve the fat-absorption over a period of 2–3 weeks in patients with formed stools. With continued therapy in the same dosage a gradual improvement in the steatorrhœa was often observed. In patients with diarrhœa, however, liver did have a rapid effect in improving fat-absorption as the diarrhœa improved. A yeast extract, 'Vegemite,' of the 'Marmite' type, was given in a dose of 5 g. four times a day to twelve patients who were already having liver extract, but whose fat-absorption

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was showing no dramatic improvement. Six patients whose fat-absorption was static or declining showed an improvement in absorption with vegemite; five patients whose fat-absorption was slowly rising with the liver treatment showed a further improvement in fat-absorption with vegemite; one patient did not respond.

DISCUSSION

These results, as well as earlier ones on fewer patients, show that the defect of fat-absorption in sprue is only partial; for even in moderately severe sprue 60–80% of the ingested fat is absorbed. Other studies in this investigation have shown that with this degree of steatorrhœa many patients have satisfactory absorption of glucose, iron, nitrogen, chloride, and iodide. As the disease progresses, and particularly with the onset of diarrhœa, the absorption defect becomes more general; in these circumstances we have found impaired absorption of glucose, iron, sodium, chloride, and nitrogen. This general absorption defect may be in some ways comparable to that found in long-continued malnutrition.

The fact that steatorrhœa disappears on a very low fat diet is strong evidence against intestinal secretion of fat playing an important part in causing steatorrhœa. The relative constancy of the percentage fat-absorption when the fat-intake is moderately increased is against those theories of the ætiology of sprue which postulate a diminished motility of the villi, or reduction in absorptive surface, when there would presumably be a diminution of percentage fat-absorption when more fat is fed. Constancy of the percentage fat-absorption with differing fat-intakes is more easily explained by theories based on the failure of an enzyme system, such as that concerned in phosphorylation (Stannus 1942).

The most striking feature in the results of therapeutic trials is that, with the dosage and preparations used, liver extract had no rapid effect on fat-absorption, whereas the yeast preparation increased fat-absorption in nearly all the patients to whom it was given. This difference in action was not due to lack of general potency in the liver extract, for clinical improvement and weight gain were striking, and non-specific absorption defects, as of glucose, iron, and chloride, disappeared with liver therapy. One possible explanation of the difference in effect between liver and yeast is the different dosage used; the maximal dose of liver extract was 10 ml. daily, whereas the yeast extract was given by mouth in the very large dose of 5 g. with each meal, four times a day. The gradual improvement in fat-absorption which was often observed with liver therapy suggests that liver contains a factor which improves fat-absorption, similar to that in yeast extract but in smaller amount. Using a more crude liver preparation than was available to us, Barker and Rhoads (1937) demonstrated an improvement in fat-absorption as judged by blood-fat curves. The fact that in our series liver was given by injection, and yeast extract by mouth, may have some bearing on the different effects observed, in view of the finding of Davis and Davidson (1944) that certain cases of refractory anæmia responded to liver given by mouth but not to liver given parenterally. Our data permit the general conclusion that there is a factor in yeast extract, and probably also in crude liver preparations, which, when given in large doses, improves fat-absorption in sprue; this factor is not nicotinic acid, riboflavine, or pantothenic acid. It may be similar to Castle's extrinsic factor.

Lately Spies (1946) has published observations on the favourable effect of folic acid in macrocytic anæmia, including that found in sprue. He describes qualitative changes in the stools of the sprue patients, after folic-acid treatment, which strongly suggest that fat-absorption was improved. It seems possible that the improvement in fat-absorption in our cases with yeast extract was partly due to its folic-acid content. It is hoped to carry out fat-balance experiments to obtain a quantitative assessment of the effect of folic acid itself on fat-absorption in sprue.

This work formed part of a G.H.Q.(I) investigation on sprue; we are indebted to the Director of Medical Services, India Command, for permission to publish this communication.

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Reviews of Books

Science and Scientists in the Netherlands Indies

Editors: PIETAR HONIG, PH.D., FRANS VERDOORN, PH.D. New York: Board for the Netherlands Indies, Surinam, and Curaçao. Pp. 491. 21*s*.

THE editors of this stately volume present a résumé of progress in many branches of natural and applied science covering more than a hundred years and nearly all the widely scattered dependencies of the Netherlands in the Pacific. This obviously has meant a vast amount of spade work, and the contributions of some 70 authors attest both the thoroughness with which the survey has been made and the enthusiasm, unbroken by misfortune and hazard, which the true scientific spirit evokes. Emphasis is given to the coöperation and stimulating influence of other nationalities, whose scientists came to study and in many cases settled down in the Netherlands Indies. An account is given of the history of beriberi and the ultimate isolation of vitamin B_1, and tribute is paid to the invaluable work of Eijkman. The long and difficult struggle to introduce cinchona into Java, which began as far back as 1829, is for the most part a story of vicissitude and many failures before success was attained. The difficulties of acclimatisation were great and in some cases the wrong plants were used, while the hostile attitude of South America did not improve matters. The question of suitable soil had to be answered, also after a long period of trial and error. One of the investigators summed up the position when he said that the habits of the cinchona seed are learned only by costly and tedious experience.

Advances in Protein Chemistry

Vol. II. Editors: M. L. ANSON, Continental Foods, Hoboken; JOHN T. EDSALL, Harvard Medical School. New York: Academic Press. Pp. 443. $6.50.

THE second volume of this journal, which is to be published annually, carries on the standards of the first. The articles, by different authors, deal with different aspects of protein chemistry. This year, as last, the articles are all by English or American investigators, but in coming years reviews will no doubt be contributed by workers of other nationalities. Swedish investigators, in particular, have made noteworthy contributions to protein chemistry. Some highly technical articles deal with the terminal amino-acids in peptides and proteins, the reaction of formaldehyde with amino-acids and proteins, protein denaturation, and the properties of protein groups. Other articles are of considerable general interest—notably a good review of the copper and zinc proteins, so important in respiration and catalysis, and a long chapter on mucoids and glycoproteins which play an important part in general physiology, and which we are only vaguely beginning to understand. There is also an article on wheat gluten and one on X-ray diffraction and protein structure. These articles are at once more specialised than those in, say, *Physiological Reviews* and more readable than those in *Annual Reviews of Biochemistry* or *Physiology*, because the writers are able to discuss critically their subjects and their development over a number of years.

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Methods of Treatment

(8th ed.) LOGAN CLENDENING, M.D., and EDWARD H. HASHINGER, M.D., clinical professors of medicine, University of Kansas. London: Kimpton. Pp. 1033. 50*s*.

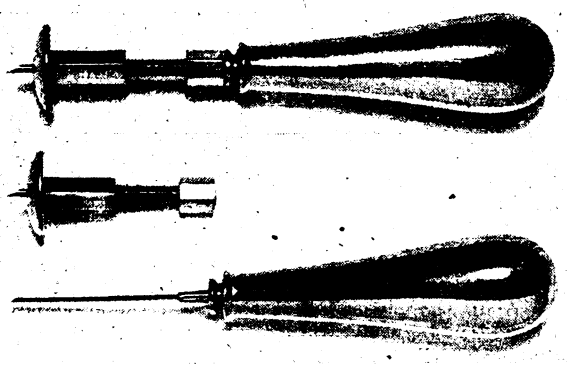
THE appeal of this book in America is reflected in the fact that eight editions have been published in twelve years. The authors try to outline all methods used in internal medicine; so the first part includes chapters on anæsthesia, physiotherapy, radiotherapy, psychotherapy, immunology, ductless glands, climatology, dietetics, and the technique of minor medical operations from the fitting of corsets to artificial pneumothorax, together with 175 pages on materia medica based on the *U.S.P.* The second part deals with the application of therapeutics to particular diseases. Naturally such a survey in a thousand pages is unlikely to appeal to the specialist or consultant. Much space is given to history, and to extracts from pioneers. Discussion of the rationale of methods of treatment, radiograms, and photographs add to the general interest, but may seem redundant to those seeking a concise manual of treatment. The book lacks balance: for example, no mention is made of the physician's part in the treatment of empyema, nor is the time for surgical drainage discussed. However, most sections are well written and treatment is advised on orthodox lines. The book may appeal to students and house-physicians who need to know something of the various measures likely to be advised by their chiefs, or by the special departments; and it may be useful to general practitioners for much the same reasons.

New Inventions

STERNAL-PUNCTURE NEEDLE

I HAVE recently designed a sternal-puncture needle which has advantages over the ordinary needle used for this purpose. The three essential points about it are: (1) a stout metal handle made in one piece with the stylet; (2) an external screw-thread on the barrel of the needle, on which the guard rides so that its distance from the needle-tip can be adjusted by simple rotation; and (3) the large size and the shape of the guard which is about an inch in diameter and has a convex presenting surface.

All sternal-puncture needles that I have previously used are fitted with an ordinary stylet. To get the necessary purchase when driving the needle gimlet-fashion through the bone it is usual to remove the



Sternal-puncture needle, with and without stylet and handle in position (overall length 5¼ in.)

stylet and insert the syringe to act as a handle. When the marrow cavity has been entered it is necessary to remove the syringe, clear the barrel of the needle with the stylet, and finally insert the syringe again to draw off the sample. Apart from the time wasted by changing the syringe and the stylet back and forth, it is often difficult, when the bone is thick and dense, to clear the barrel with the stylet. Moreover, a syringe is not the ideal form of handle for the purpose. With the new needle one bores through the bone with both stylet and handle in position; one then removes both of them together and inserts the syringe.

With the exception of a needle which I purchased in Vienna some years before the war and which was fitted with a threaded guard similar to that in the present needle, sternal-puncture needles usually have guards held in position on the needle with a set-screw. If one fails to enter the marrow cavity at the first attempt, it is often difficult to loosen this set-screw; and, when it has been loosened, the guard rises on the underlying soft tissues, on which it has been pressed, for a distance about which it is difficult to be certain. One is thus apt to lose one's bearings. With the threaded guard, however, one merely has to give it a definite number of turns to increase its distance from the tip of the needle by the desired amount.

There are great advantages in the large diameter and convex presenting surface of the guard. In the Vienna needle, as in other needles on the market, the guard is of much smaller diameter and has a *flat* presenting surface, which tends to cut and bruise the soft tissues on which it presses. With the Vienna needle it was impossible, for this reason, to rotate the guard, unless one first partially withdrew the needle to relieve the pressure on the underlying skin. With the new needle this is unnecessary. If, before inserting the needle, a drop of sterile liquid paraffin is smeared with the finger on the convex surface of the guard, it is easy to rotate the guard, even when pressed home, without dragging on the underlying skin.

The refinements embodied in this new needle greatly simplify the operation of sternal puncture, particularly in the occasional more difficult case or when the operator has comparatively little experience of the technique.

The instrument is made by Messrs. S. J. Owen, of 35 Northampton Square, E.C.1.

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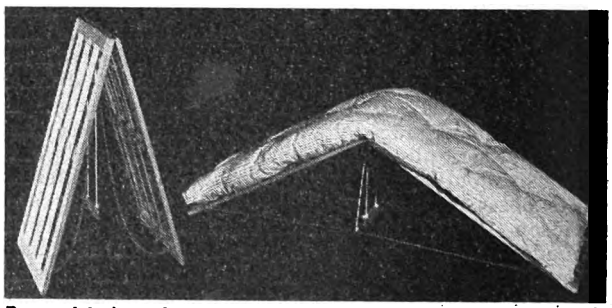
PORTABLE POSTURAL DRAINAGE APPARATUS

POSTURAL drainage as a method of treatment for suppurative conditions of the lungs and bronchi is rightly becoming more generally used. In severe cases the Nelson bed is undoubtedly the best apparatus. In milder cases, however, it has disadvantages, and during the war it has been unobtainable; it is rather costly, especially for cases where postural drainage is on trial, it is ugly in a room, and it is immobile. Many forms of similar apparatus have been made by hospital and amateur carpenters but they are usually clumsy and cannot be readily obtained.

Recently Mr. Hamilton Smith, of Messrs Heal & Son Ltd., has made a drainage frame for me which obviated most of these difficulties. It consists (see figure) of two slatted inclined planes made of light wood but sufficiently strong to support a patient of any weight. At the top the planes are joined by strong hinges. The bottom ends



Postural drainage frame, partially closed, and extended with mattress in place.

are kept at the desired distance by light chains which are adjustable so that the correct angle can be obtained. The apparatus folds up easily, and a weight fixed between the planes draws the chains out of the way.

The apparatus weighs 11 lb. without the mattress and can be easily carried in a public conveyance or car, or stowed away in a cupboard. It can be obtained from Messrs Heal & Son Ltd., of Tottenham Court Road, W.1, price about £2 17*s*. 6*d*. in polished wood and £2 10*s*. unpolished.

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THE LANCET

LONDON: SATURDAY, APRIL 20, 1946

Towards a World Health Organisation

INITIAL pessimism about the establishment of an international health organisation [1] has been largely dispelled by the Paris meeting concluded a fortnight ago. A considerable measure of agreement was reached, and general approval is likely to be given to the proposals formulated, which are now to be submitted to governments, to the Economic and Social Council of UNO, and to a world health conference which is meeting in New York on June 19.

The main task of the 16 experts,[2] assembled under the chairmanship of Dr. RENÉ SAND, was to draw up constitutional proposals for the creation of a new World Health Organisation—to use the title proposed by Dr. SZE and accepted by the committee. Drafts were submitted by Sir WILSON JAMESON, Surgeon-General THOMAS PARRAN, Dr. A. STAMPAR, and Dr. A. CAVAILLON, and the committee unanimously agreed on the creation of a single world-wide health organisation as a specialised agency of UNO. (The proposals by Dr. RAJCHMAN, for 18 years director of the health section of the League of Nations, which we print on another page, were available to the meeting though they could not be formally considered.) It was also agreed that the W.H.O. should carry on its work through a World Health Conference, meeting annually; an executive board of 12–18 members, meeting at least twice a year; a director-general appointed by the conference on the nomination of the board; and a secretariat. No recommendation was made as to the location of its headquarters, the members being fairly evenly divided between placing it in the U.S.A., with UNO, or in Europe, perhaps at the European regional office of UNO. Another question on which agreement was not reached was whether the Pan-American Sanitary Bureau should continue as an autonomous regional bureau of W.H.O. or should in due course be merged with the latter. The decision ultimately rests, of course, with the American republics who constitute the Pan-American Sanitary Bureau; but the experts, by 9 votes to 6, favoured eventual absorption.

The aims of the new organisation as set out in the preamble to the constitutional proposals are wide and high, and a definition of "positive health" is included in the statement that health is a state of physical fitness and mental and social well-being and not merely the absence of infirmity and disease. The importance of individual and collective "emotional health" is specifically mentioned, thanks to the striking contribution to the debates by Dr. G. B. CHISHOLM of Canada. Membership is open to all countries, whether or not they participate in UNO. A somewhat revolutionary proposal is that delegates to the World Health Conference should have authority to commit their governments to international regulations covering such matters as quarantine, nomenclature of causes of death and disease, and standards of drugs and biological products, provided their governments do not express dissent within a stated period. If adopted, this new principle of "contracting out" of obligations instead of "contracting in" should make things move much faster in the field of international health.

Now that the assets of the League of Nations have been absorbed by UNO, and UNRRA is due to disappear at the end of 1946, insistence on a single World Health Organisation means that the Office International d'Hygiène Publique in Paris will eventually disappear. Unfortunately the experts made no recommendation on the machinery to replace the Paris Office in administering the international sanitary conventions, which are the linch-pins of international coöperation in health. No doubt the permanent committee of the Paris Office, which meets on April 24, will have something to say on this point; and it is to be hoped that the conference in June, though somewhat unwieldy, will be able to establish satisfactory arrangements. All in all, however, good progress has been made, and we must hope that political, financial, and administrative factors will not stultify the plans agreed on.

1. See *Lancet*, March 9, p. 352.
2. Their names were given on March 2, p. 321.

Prevention of Sunburn

MANY substances have been used to protect the skin from sunburn, but they vary considerably in efficiency. Before the recent war, many of the ointments or creams used for this purpose contained a light-dispersing agent (e.g., titanium dioxide) and suitable pigments, such as umber, or red and yellow oxides of iron, mixed with screening agents such as quinine (2–8%), salol (5–10%), disodium phenol (5%), or tannic acid (10%). In 1939 BACHEM and FANTUS [1] reported that wool fat, yellow petrolatum, and diachylon ointment were efficient protectives against ultraviolet rays, while ichthammol, even in concentrations as low as 2%, æsculin (a glucoside found in horse-chestnut bark), and menthyl salicylate were useful but less satisfactory for the purpose.

During the war our American allies were concerned because of the severe sunburn experienced by men marooned on life rafts or in the desert after aeroplane crashes, especially as, for various reasons, most of these airmen lost much of their clothing and were greatly exposed to the sun. Any preparation provided had to pass some special criteria: because it would be carried to great heights in aircraft it must not burst its container if it froze, neither must its elements dissociate under extremes of temperature; it must give maximum protection and skin coverage per unit weight or volume; to be of value to seafarers it must not wash off easily; finally, like all other screening agents, it must not be toxic or irritate the skin. LUCKIESH and colleagues [2] were asked by a high authority of the U.S. Army Air Forces to consider the problem. These workers believed that sunburn caused by exposure to natural sunlight was principally due to ultraviolet energy of 2900–3200 Angström units; a protective cream should be so opaque to these rays that a thin coating would give complete protection for many hours of continuous exposure. In order to hasten their inquiry they used a device previously employed by two of their number—LUCKIESH

1. Bachem, A., Fantus, B. *Arch. phys. Therap.* 1939, **20**, 69.
2. Luckiesh, M., Taylor, A. H., Cole, H. N., Sollmann, T. *J. Amer. med. Ass.* 1946, **130**, 1.

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and TAYLOR—whereby ultraviolet rays from a suitable source were focused by quartz lenses on an aperture in a metal diaphragm; the rays passing through this opening produced a minimum perceptible erythema on average untanned human skin in 8 seconds, and the output in one minute was regarded as equivalent in erythema-producing value to exposure for one hour to the most intense sunlight experienced during a recent period of four years in Cleveland, Ohio. Europeans can estimate the intensity of sunlight in that city by remembering that it is situated in about the same latitude as Rome. Many substances were tested for screening efficiency by means of this apparatus; they included titanium dioxide, salol, zinc oxide, zinc ointment, yellow and white petrolatum *U.S.P.*, and amber petroleum jelly. Later, in view of the results obtained, the screening powers of several other types of petrolatum were investigated.

The most interesting result in the entire series was with regard to 'Dark Red Vet. Petrolatum' (Standard Oil Co.). This is a refined grade of petrolatum and is said not to irritate even a sensitive skin. It is derived from a particular type of crude oil and does not contain anthracene derivatives. It adheres tenaciously to skin and can scarcely be removed by scrubbing with soap and water. A thin coating gave complete protection to an exposure equivalent to 20 hours of the strongest intensity of sunlight experienced in Cleveland. Of the other substances, salol (phenyl salicylate) was found to be an excellent screening substance; its efficiency was reduced when it was mixed with zinc oxide—perhaps because this oxide coated the particles of salol—and it was effective when incorporated in a concentration of 10% in yellow petrolatum *U.S.P.* Investigation showed that salol ointment does not cause toxic effects when rubbed on large areas of skin. For sun-screening purposes the salve must be properly compounded, for uneven dispersal of the salol in the preparation will make it less efficient. LUCKIESH and colleagues found that titanium dioxide incorporated in either complex or simple vehicles was not a very reliable protective agent and was inferior to zinc oxide, which is of value in preventing sunburn; menthyl salicylate was not satisfactory; yellow petrolatum is an efficient screen for ultraviolet rays of 2967 and 3022 A, and was much more efficient than white petrolatum. They recommend that, for the requirements of marooned aviators, dark red vet. petrolatum and the same material mixed with 10% salol should be issued for trial.

In the days before the war, when self-prescribed and self-administered heliotherapy was practised on all the bathing beaches of Europe, experienced sunbathers used to say, "Don't use a fatty cream to protect your skin; if you do, you will not sunburn but certainly you will fry." Many plausible arguments have been used to disprove this belief, but the lessons of practical experience should never be lightly dismissed, and perhaps the textbooks are incorrect in attributing sunburn solely to the action of ultraviolet rays; for infra-red rays of sufficient intensity do indeed cause erythema, blistering, and (ultimately) pigment formation. Those who have the opportunity might investigate again the parts played by these two forms of radiant energy in producing true sunburn. Meanwhile, before their more fortunate colleagues include dark red vet. petrolatum or salol ointment in their ruck-sacks or family suitcases, they should remember that the work of LUCKIESH et al. does not tell us how far applications of these sun-screens retard the normal mechanisms of sweat-evaporation, convection, and possibly also conduction and radiation, whereby the body surface is kept cool and the body temperature is regulated; for otherwise, though they may avoid injury by ultraviolet rays, they may fall victims to heat exhaustion or some other manifestation of the wrath of Helios.

Traumatic Aneurysm

THE development of an aneurysm after injury to a blood-vessel is often a life-saving event for both the patient and the limb. The distal pulse usually continues, and time is allowed for the repair and growth of the collateral vessels. The steps in the formation of the aneurysm were worked out by MAKINS in the 1914–18 war. The first stage is the hæmatoma—a solid clot compressed by the overlapping of the muscle and fascia layers. If this is to form, there must therefore be small entrance and exit wounds; any shattering of bone will disrupt the tissue spaces so that the blood will merely pool. In a few days, or sometimes weeks, the pulsating blood-stream hammers out a small cup-shaped depression in the clot, and the swirling blood polishes it. Intima grows in and lines the walls of the cup. It is now an aneurysm; a "false" aneurysm, for the original intima and muscle form no part of its boundary wall. The organised hæmatoma is its limiting layer, and within this fibrous-tissue capsule its inexorable enlargement continues. Clinically, it can be easily diagnosed by the systolic bruit heard over it; so every surgeon, before exploring an injury in the region of a large vessel, should use his stethoscope. PATERSON ROSS [1] points out that this may not always be the course of events; where the tissues are lax, as in the neck, axilla, or femoral triangle, the blood may remain more fluid with a central clot alone plugging the hole in the vessel. This type of clot is easily disturbed by transport or movement, and the surgeon may then be forced to operate early because of the rapidly enlarging hæmatoma, with pressure effects on the collaterals. Two useful measures to assist aneurysm formation were adopted in this war. First, as MAYBURY [2] recommended, the suturing over the contused vessel of a musculofascial barrier which will ensure that any late leakage will be compressed and locally contained. Secondly, where the hæmatoma is infected it has been found possible to evacuate the pus through a separate incision, leaving the main clot undisturbed; here penicillin has been a valuable adjunct.

Speakers discussing this subject at the Royal Society of Medicine on March 6 mostly favoured delaying operation 3 or 4 months, unless there is severe pain from compression of nerve or vein. The hæmatoma causes much local reaction, leading to binding and matting of the tissues ("firm bacon"), and early operation—especially in the 3–4 week period—is therefore a formidable task. Russian and German surgeons have however been advocating early operation, which spares the patient the waiting period, avoids compression of the collaterals by the hæmatoma, and often permits suture of the vascular

1. Ross, J. P. *Brit. med. J.* 1946, 1, 1.
2. Maybury, B. C. *Bull. War Med.* 1945, 5, 420.

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defect. M. BOYD, in the R.S.M. discussion, thought there was something to be said for this view; and added that associated sympathectomy would give all the collateral dilatation needed. Some American workers [3] have expressed a similar opinion. But this view discounts the modern teaching that with time there is an active growth and enlargement of the collateral vessels; it denies also the experimental evidence that the interlacing capillaries of the ischæmic boundary dilate and become converted into arterioles and venules. The factors influencing the growth of collateral vessels are complex; it certainly depends on more than nervous control. LEWIS [4] regarded local chemical stimulation as the main factor; probably raised pressure inside the collaterals is also significant and has an important bearing on treatment. The great enlargement of the collaterals which may occur was demonstrated at the R.S.M. meeting by J. R. LEARMONTH, who described a case in which the place of the ligated femoral artery was filled by the external circumflex artery, which rose from it directly; the collateral input here was so adequate that after sympathectomy the temperature of the foot rose 8° F. The immediate repair of a hole in a blood-vessel, although theoretically attractive, is not always practical or advisable. Even when the hole it makes is small, the modern missile imparts a widely lacerating blow to the adjacent vascular coats; there is thus a considerable risk of sloughing at the suture-line. To open the arterial hæmatoma or the early aneurysm, most surgeons will agree, nearly always ends with a ligature. How disastrous this may be in war was illustrated by the figures quoted by MASON BROWN—31 femoral ligations, 21 amputations; 36 popliteal ligations, 26 amputations. MUSTARD'S [5] experience with the Canadian Forces was similar, and PORRITT and colleagues,[6] working under good conditions with the B.L.A., found that in 50% of cases injury to the femoral artery led to loss of the limb. With the late operation LEARMONTH, MAYBURY, and other speakers showed that, where some form of vessel division was employed, it was rare for the patient to lose life or limb. MASON BROWN sutured 21 out of 78 cases of arterial or arteriovenous aneurysm, but he did not regard this as necessarily the method of choice.

The operation for aneurysm is now a well-planned procedure, with none of the old-fashioned drama of the surgeon boldly incising the sac and then groping for the vessels in its depths. It is a cardinal principle, before beginning to dissect the sac, to have control of the main vessel, either by pneumatic tourniquet or by deliberate proximal exposure. Tapes are passed behind the vessel so that it can be kinked by the assistant, or the vessel is occluded by tying the tapes over a piece of rubber tubing; this is less damaging than a clamp. Thus the external or the common iliac artery, or better both,[7] may be exposed by an extraperitoneal approach and controlled before a high femoral aneurysm is dealt with. Access to the aneurysm has also been improved. A central section of the clavicle, for example, may be resected to give access to the subclavian aneurysm (third part); the absence of pain and rapid restoration of movement after this procedure are remarkable. Division of the clavicle by gigli wire, in the manner of FIOLLE and DELMAS, provides a clear view of the axillary aneurysm. Resection of the fibula, as advocated by ELKIN,[8] will expose the anterior tibial aneurysm near its origin—an important point, for, as BOYD remarked, it is surprising how often this apparently small aneurysm turns out to be a large one burrowing through the interosseous membrane. For the innominate aneurysm splitting the sternum gives a good exposure, and LEARMONTH described a subclavian aneurysm extending into the superior mediastinum, where he had to remove the inner end of the clavicle and upper part of the sternum; the patient is now working as a crane-driver, and even testing his arm by hanging from the crane. A "new" advance—known to MATAS [9] sixty years ago—is the recognition that the aneurysm sac is better left in situ. This robs the surgeon of his specimen, and makes him feel that he has performed an incomplete operation, but it avoids damage to the collateral circulation and to the nerves and other important structures in the sac wall. The usual procedure, after controlling the vessel, is to open the sac. A metal dilator is then passed and dissection continues just outside the sac; the vessel is divided between ligatures (preferably silk or thread) as close to the sac wall as possible. The metal dilator is a valuable guide, for the blood within the curved sac rotates and distorts the vessel. This is the method of ANTYLLUS, described in the fourth century A.D. The remote proximal ligature of HUNTER is no longer used in traumatic aneurysms, for it cuts off important collaterals and will not in itself cure the aneurysm. HOLMAN [7] maintains that the proximal ligature should be applied just distal to the nearest main collateral; otherwise a blind vessel stump will be left in which the force of the blood-stream will be dissipated; it has been shown experimentally that the pressure in the main collaterals is 10 mm. Hg higher if his advice is followed. LEARMONTH, however, pointed out that numerous small muscle branches are thus forfeited and that it is difficult to identify the main collateral; HOLMAN'S view also ignores the work of LE GROS CLARK and BLOMFIELD,[10] who have demonstrated the importance of the intramuscular lake anastomoses. ELKIN,[11] after a wide experience in one of the two main vascular injuries centres in the United States, declares that such dissection outside the sac is unnecessary, and advocates intrasaccular suture of the vessel openings (MATAS'S endoaneurysmorrhaphy). In this procedure, after the sac is opened the entrance and exit are either underrun with figure-of-eight sutures or are dissected inside the sac to enable direct ligatures to be applied. This is an excellent technique, and its only obvious disadvantage is that the vessel is ligated while on the stretch. The operation has a particular advantage when the vessel is injured close to a main bifurcation, when any dissection around the sac would lead to the ligation of the two distal streams as well as the main one. Such "triple" ligation (as MAYBURY calls

3. Gray, K. H., Benson, C. D., McDonald, A. M., Adams, H. D. *Nav. med. Bull., Wash.* 1946, **46**, 14.
4. Lewis, T. *Clin. Sci.* 1940, **3**, 276.
5. Mustard, W. T. *Canad. med. Ass. J.* 1945, **53**, 128.
6. Porritt, A. E., Debenham, R. K., Ross, C. C. *Brit. med. J.* 1945, ii, 377.
7. Holman, E. *Surg. Gynec. Obstet.* 1944, **78**, 275.
8. Elkin, D. C., Kelly, R. P. *Ann. Surg.* 1945, **122**, 529.
9. Matas, R. *Philadelphia med. News*, Oct. 27, 1888.
10. Le Gros Clark, W. E., Blomfield, C. B. *J. Anat.* 1945, **79**, 16.
11. Elkin, D. C. *Surg. Gynec. Obstet.* 1946, **82**, 1.

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it) is dangerous; for on the free flow of blood across the vessel crutch depends the final even distribution of the blood-flow. Both the MATAS and ANTYLLUS methods leave the sac in situ; this in itself causes no disability or deformity and slowly resolves. A few fine thread stitches may be used to approximate its walls, but there is no need to freshen or denude its surfaces, for as MONT REID has shown they adhere as does the sutured peritoneum. From America there have been a few reports of the successful use of vein grafts threaded through vitallium cannulæ in the manner suggested by BLAKEMORE and LORD.[12] Most surgeons have felt that the results of some form of Antyllus operation have been so good that they have been reluctant to risk the patient for the sake of a mere technical triumph.

On two points there is no general agreement. First, should the satellite vein be ligatured at the same time? Certainly not when the artery has been sutured, for PATERSON ROSS [1] has drawn attention to the unpleasant effects—an aching and bursting feeling in the leg on standing or sitting for some time—that may follow. In the acute injury, as a rule, the vein will be contused or lacerated and ligature will be inevitable. The experimental evidence, as F. ALBERT indicated at the R.S.M., favours vein ligation, for it will limit the outflow and restore the circulatory balance. But in the aneurysm case, with its good collateral circulation, it is unnecessary. BOYD and MASON BROWN say that the same effect can be obtained by tilting the top of the bed. Secondly, the advisability of sympathectomy at the time of the operation, or some weeks previously, is still under debate.[13] BOYD was strongly in favour of this practice, whereas LEARMONTH no longer regarded it as essential, except for the carotid aneurysm. MAYBURY and COHEN said at the R.S.M. that they did not do sympathectomies as a routine. ELKIN [11] has reported on 106 "false" aneurysms, of which 61 were treated by the Matas procedure and 45 by some kind of vessel ligature; none of the cases had sympathetic interruption, and there were no deaths, no gangrene, and no recurrences.

The waiting period for operation is well spent in controlled muscle exercises. The collaterals at the same time can be forced to open by ancillary methods such as regular heat, infusions of hypertonic saline, and rapid transfusions of blood or plasma. Intermittent compression of the vessel proximal to the aneurysm, in an attempt to force the collaterals, is no longer practised; as REID has pointed out, this increases the risk of clotting in the sac and subsequent embolism. The advent of penicillin has reduced the hazard of sepsis in these long difficult operations. Diathermy for the fine bleeding points ensures complete hæmostasis and avoids the need for a drainage tube—a great courier of sepsis. The principles of management of the ischæmic limb, as set out in the Medical Research Council War Memo no. 13, are now generally appreciated. There has, however, been a dangerous swing over from extreme heat to extreme cold. The limb should merely be encased in a sterile towel and left exposed to room temperature.

12. Blakemore, A. H., Lord, J. W. *Ann. Surg.* 1943, **117**, 481; *J. Amer. med. Ass.* 1945, **127**, 687, 748.
13. See Cohen, S. M. *Lancet*, 1944, i, 1; Siddons, A. H. M. *Ibid*, 1945, ii, 77.

Annotations

CHILDREN AND ROAD ACCIDENTS

IN the House of Commons a week or two ago [1] road accidents were rightly described as one of the major social evils in our national life. Even during the war they inflicted far more casualties on our civilian population than were caused by enemy action. As petrol returns, the danger will grow again.

The Minister of Education has reminded local authorities of the Government's campaign for road safety and has asked them to help highway authorities in establishing local safety organisations, which will be supplied with monthly particulars of accidents in their areas. The London County Council [2] note that up to the year 1935–36 accidents to school-children in the administrative county were rising with the increase in fast traffic, and seemed likely, despite an annual fall of 22,000 a year in the school roll, to reach a figure of 5000 accidents a year. A committee of the council which studied the subject with the help of Scotland Yard found that 1 boy in 12 met with a traffic accident during the nine years of school life; among girls, less daring or more sensible, the figure was 1 in 25. Rather more than 7 out of 10 accidents to children occurred during the hour before morning school, at dinner-time, and in the hour after school. The committee's conclusions were sent to every head teacher under the title of "Road Safety and the London Child," and were also issued to every local authority in the country by the Ministry of Transport. They probably had some influence, for the number of accidents per 10,000 children in London fell from 95·6 in 1935–36 to 92·1 in 1938–39—a small reduction, but welcome. Since the lifting of the blackout it has been hard to say exactly how things are going, but it seems significant that in 1945 traffic accidents to children between 5 and 15 rose from 126 during April to 196 during October. The monthly average was 6·8 per 10,000 as against 7·7 in 1938–39; but since the number of motors now on the road is only about two-thirds of that in the year before the war, and since these are doing smaller mileage owing to petrol rationing, the lower figure is not a cause for satisfaction. Moreover, seven times the number of children are having school meals, and are thus kept off the roads during one of the danger hours.

The council have considered how to fulfil the Minister of Education's wish that children should be taught road sense at school more capably than they have been in the past. Several old rules of the council which have been in abeyance to some extent during the war are at once being revived. Thus children are forbidden to bring to school fairy-cycles, scooters, and roller-skates, and are to be discouraged from stealing lifts at the back of lorries, and from playing with balls, tops, or marbles, or reading books, between home and school. Another good plan being revived is to let the junior boys in all schools out into the playground for exercise just before going home, so that the worst of their pent-up activity has worn off before the gates are opened. Where schools open on a busy road a teacher is to stand at the gates while children are leaving, to prevent them tumbling out in a wave. The rule requiring that "some training in road sense" shall be given weekly is to be strengthened by substituting the words "adequate and suitable" for "some." Policemen, before the war, used to come and give talks and demonstrations in schools, and these carried great weight with the children; at present police are scarce, like everything else, but talks are to be given again as soon as possible. The council is encouraging the experimental appointment of "traffic monitors" from among the children, who will control their fellows

1. See *Lancet*, April 6, p. 521.
2. General Purposes Subcommittee Report, Feb. 12, 1946.

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at danger-spots near the school. The consent of the parents must be gained before a child is appointed as a monitor. Those who cycle to school must join the school cyclists' club and be issued with a licence by the council and must pass an examination on the Highway Code. Red rear-lights are now required by law.

Films on road safety have been found useful, and have been produced in good numbers by the Royal Society for the Prevention of Accidents and the Ministries of Information, War Transport, and Education. The society has also produced a safety newspaper for children up to the age of 12. Local safety organisations, especially borough children's safety committees, are expected to do much good, and the monthly charting, on a large-scale map, of the sites of accidents promises to spotlight danger-points. The Pedestrians' Association, however, argues that "fussy 'safety first' activities," besides leading to much expenditure, will only dissipate energies of the police which would be better employed in enforcing the law on the roads.[3] They point out that in the Metropolitan police area, owing to lack of men, police have been withdrawn from 30% of those dangerous crossings near schools which were previously controlled at times when children arrived and left. They disapprove of the monitor system on the ground that if a road is dangerous enough for young children to need help in crossing it, then the responsibility should fall on a grown person. Such differences of opinion may be reconciled by the work of the Road Research Board established by the Department of Scientific and Industrial Research. The board has been reconstituted to meet the recommendations of the Alness report of 1939 and is to advise on a programme of research. The chairman is Sir Frank Smith, F.R.S., former secretary of the department, and the board includes engineers, professors of physics and economics, surveyors, an assistant commissioner of police, and representatives of British Chemical Manufacturers and Morris Commercial Cars.

A complete cure for this ill is not to be achieved at present; but diverse measures, taken together, may help to reduce the death-roll until we can act on the principle that children and motor-cars, like children and railway trains, should not share the same permanent way.

MALARIA AND SYPHILIS

WHEN the complement-fixation test for syphilis was first described by Wassermann it was soon found that occasional false reactions occurred in malaria and some other diseases. Since then many workers have tried to explain these rare lapses in one of the most reliable of serological tests. The controlled observations of Eagle and his colleagues[4] in non-syphilitic patients with induced malaria revealed 82% of false positive flocculation and Wassermann tests, and other workers have found even higher percentages of false reactions with the Kahn test. Babin and Dulaney[5] in Tennessee have now given a new and practical slant to this problem by studying sera collected at intervals of 3–5 days from 200 patients suffering from relapsing malaria caused by *Plasmodium vivax*. Of 1851 sera tested, 129 or 7% gave positive Wassermann reactions and only 47 of the 200 patients developed a positive test during the time of observation. One of the most significant points about this study was the distribution of the positive reactions in relation to the day of malarial attack. Thus, only 14% of the positives preceded or coincided with the day of the paroxysm, whereas 86% of them were found after the attack, usually after about 6–10 days. The percentage of positive reactions is smaller than, and cannot be usefully compared with, that obtained by previous workers, whose patients were studied throughout the course of induced malarial infections, but the significance of the results is obvious. To find out whether the incidence of false reactions in induced malaria was greater, Babin and Dulaney tested the sera of 22 syphilitic patients inoculated with *P. vivax*, *P. malariæ*, and *P. falciparum*. Eighteen of the sera showed a rise in Wassermann titre coincident with a rise in the titre for complement-fixing antibodies for *P. knowlesi* antigen. In general there was close correspondence between the titres of complement-fixation tests in both malaria and syphilis, and in 11 cases the highest titre for both diseases occurred on the same day. It was also found that 14·5% of 408 syphilitic sera gave strongly positive false reactions with the malaria complement-fixation test.

If there is doubt about the reliability of the Wassermann reaction in naturally acquired malaria, does the same apply to other serological tests for syphilis? Robinson and McKinney[6] have performed Kahn flocculation tests on blood and spinal fluid from 100 non-syphilitic soldiers who had *P. vivax* in smears of the peripheral blood. In all cases the spinal-fluid Kahn reaction was negative, but 33 soldiers had a positive blood-test and 11 were classed as doubtful. These patients were treated with mepacrine, and weekly Kahn tests showed that all positive and doubtful reactors were completely negative by the end of the eleventh week. The results are in general agreement with those of Babin and Dulaney.

It has been suggested that these findings reveal a common or closely related antigenic component in the organisms of the two diseases, but study along these lines must be continued. The alternative theory, that malaria activates latent syphilis, is less likely. There are other possible explanations for these unfortunate cross-reactions and it may be that specific antibody is not concerned. At present the point to remember is that men returning from abroad may have a positive Wassermann or Kahn reaction yet may not have syphilis.

LOCAL ACTION OF PENICILLIN ON THE BRAIN

PENICILLIN has gained an assured place in the treatment of some forms of infective meningitis,[7] but in the present phase of trial and observation the optimum doses for direct instillation into the ventricles and meninges cannot be regarded as established. The danger that excessively large quantities of penicillin injected into the ventricles might produce fits or other severe cerebral reactions was referred to by Smith and colleagues,[8] of Oxford, who have found that a single daily lumbar injection of 3000–16,000 units will usually maintain an effective concentration in the cerebrospinal fluid in pneumococcal meningitis. Walker and colleagues[9] have injected 0·05–0·1 c.cm. of penicillin solution in varying concentrations directly into the cerebral cortex of monkeys, and find that convulsions occur if the concentration is above a certain threshold. This threshold varies for different parts of the cerebrum and corresponds to the degree of electrical excitability. Thus the motor cortex is more susceptible than the parietal or visual cortex. The concentrations used in these tests, however, ranged from 5000 to 40,000 units per c.cm. The Oxford workers used the much lower concentration of 2000 units per c.cm. in their cases without mishap. Electroencephalographic tracings obtained in monkeys by Walker and his co-workers confirmed the view that these fits resulted from the irritative effects of penicillin on the cortex. No histological studies were made, but Russell and Beck[10] have observed that the application of sodium penicillin

3. Pedestrians' Association Quarterly News Letter, no. 52, April, 1946.
4. Eagle, H., Mays, F. R. S., Hogan, R. B., Burney, L. E. *Amer. J. Syph.* 1941, **25**, 406.
5. Babin, F., Dulaney, A. D. *Amer. J. Hyg.* 1945, **42**, 167.
6. Robinson, H. M., McKinney, W. W. *J. Amer. med. Ass.* 1945, **129**, 667.
7. *Lancet*, Feb. 16, p. 240.
8. Smith, H. V., Duthie, E. S., Cairns, H. *Ibid*, Feb. 9, p. 185.
9. Walker, A. E., Johnson, H. C., Kollros, J. J. *Surg. Gynec. Obstet.* 1945, **81**, 692.
10. Russell, D. S., Beck, D. J. K. *Lancet*, 1945, **1**, 497.

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in a concentration of 10,000 units per c.cm. to the rabbit's brain causes considerable necrosis and hæmorrhage.

The observations of Walker and colleagues do not support the suggestion that this irritation is due to impurities in the penicillin preparations: the effects in their monkeys were proportional to the antibiotic activity of the preparation; crystalline penicillin in equivalent doses had the same effect; and, as a rule, inactivation of the penicillin depressed the convulsive and antibiotic actions proportionately. For these reasons Walker and Johnson [11] urge that more attention should be paid to the possibility of controlling infection of the central nervous system by the systemic administration of penicillin. In their view, although the passage of penicillin through the blood-brain barrier is negligible in the normal subject, a sufficient concentration in the C.S.F. may be attained in the presence of meningitis owing to the greater vascular permeability. But the observations made at Oxford [8] showed that the concentrations attained in the C.S.F. by such measures were never adequate, and that patients with recurrent meningitis could develop a relapse while receiving penicillin in what should be adequate systemic dosage. Other fungus-products—streptomycin, streptothricin, actinomycin, and clavacin—have been similarly investigated by Walker and his co-workers,[12] who briefly report clinical and electro-encephalographic convulsive effects of the same kind as those produced by concentrated penicillin. With the last three products these effects were severe enough to preclude their local application to the brain.

All observers seem to agree that, in the control of meningitis with penicillin, levels of dosage must be worked out that ensure control of the infection but are not excessive either in concentration or volume. In the treatment of localised infections of the brain, such as abscess, the same stringency does not apply, for here the brain-tissue is walled off by a zone of inflammatory granulation tissue through which penetration is slight. Hence it may be good treatment, in such a situation, to instil amounts that would be contra-indicated in meningitis. In parallel with this, it was found during the war that sulphathiazole powder could be applied without harm to the brain in already traumatised areas, whereas this sulphonamide has been proved to be epileptogenic when applied to the intact brain.

MANTOUX CONVERSION IN HOSPITAL STAFFS

THE Joint Tuberculosis Council have published a memorandum of advice to hospitals and institutions on the care of staff at the time when the Mantoux reaction changes from negative to positive. They specifically recommend that such institutions should not employ Mantoux-negative staff unless the principles set out in the memorandum can be followed in detail. They recommend that when a person whose Mantoux test was previously negative develops a positive response, he or she should immediately be examined physically and radiologically, and should be re-examined at three-monthly intervals for a year. They divide cases into four groups:

I.—Those with no symptoms or radiological evidence of a primary complex in the lungs, and no significant increase in the sedimentation-rate.

II.—Those with no symptoms, and no gross enlargement of hilar glands, whose sedimentation-rate has increased.

III.—Those with no symptoms who have an enlarged gland or glands at the hilum, with or without an obvious primary focus in the lung or an increased sedimentation-rate.

IV.—The clinically ill.

Those in group I, they hold, should be advised to keep to a "work and bed" routine for a month, being allowed to do full duty in one shift—say from 7 A.M. to 4 P.M. with the usual time off for meals—and staying in bed all the time they are off duty. Those in group II should spend not more than 4½ hours on duty, and should go to bed for the rest of the 24. Those in group III should be taken off duty and go to bed for a month. Those in group IV will be treated, of course, as their condition demands.

The advice for groups I and II, though sound clinically, seems weak psychologically. People who are told that they are fit to do either a full or a short day's work cannot but feel that they are fit for a little recreation too. It might be better therefore to give group I 7 hours of duty and 2 hours of leisure, and group II 3½ hours of work and 1 hour of leisure, advising them that the leisure should be taken easily. The memorandum as a whole, however, is thoroughly useful, and should lead to a rise in the present standards of care of Mantoux-negative staff.

EXPERIMENTAL TUMOUR PREVENTION

VARIOUS journals and publications devoted to cancer research [1] reflect widespread and increasing attention to biochemical aspects. It is refreshing to note that whereas the trend in the past has been to produce tumours more efforts are now being made to inhibit them. This line of attack may be expected to yield information on the whole process of tumour growth, including the stage when the inhibition intervenes. The exact meaning of the term itself may also become clear.

In the latest report of the Imperial Cancer Research Fund [2] Prof. W. E. Gye, F.R.S., relates the valuable contribution of Mr. H. G. Crabtree to the general trend; and in so doing he reduces the subject to its bare bones and puts it in perspective. When, for example by various dietary deficiencies, spontaneous mammary tumours of inbred mice are reduced in number or excluded, it is pertinent to ask how the treatment, which is drastic, is effective. Mammary development in the mouse as in other creatures is postnatal. Did the treatment suppress the anatomical outgrowth that provides the cellular basis for the tumours? This might happen through general systemic starvation or by damage to endocrine glands on which mammary development depends. Too often the question is left unanswered. At a later stage also systemic starvation can inhibit a tumour. When the change to malignancy has already occurred in an adequately grown mammary gland, lack of the wherewithal may prevent that increase in size which is due to cell multiplication and which enables us to identify a tumour. These types of inhibition or arrest of growth are not specific against tumour growth; they merely depress the normal building up of cells in general. Even malignant cells require their rations.

Delay in incidence of induced skin tumours, achieved by Crabtree, is in another category. Hydrolysing halogen compounds, compounds that are eliminated by mercapturate formation, and unsaturated dicarboxylic acids all delay completion of the carcinogenic process and the last perhaps prevent it. These varied compounds have in common the property of combining with SH-containing cell constituents, the unsaturated dibasic acids by forming additive compounds. Crabtree suggests that chemical carcinogens also combine, as a first reaction, with free SH groups, a fixation which is prevented by inhibitors which possess the same combining capacity. The inhibitors, however, might act merely by depriving cells of essential S-containing amino-acids. Crabtree considers this explanation inadequate to account for the suppression of tumours that was observed in the following experiment.

11. Walker, A. E., Johnson, H. C. *Ann. Surg.* 1945, **122**, 1125.
12. Walker, A. E., Johnson, H. C., Case, T. J., Kollros, J. J. *Science*, 1946, **103**, 116.

1. *Cancer Research*, Baltimore; *Journal of the National Cancer Institute*, Bethezda; A.A.A.S. Research Conference on Cancer, Washington, 1944.
2. 43rd Annual Report of the Imperial Cancer Research Fund. Obtainable from the fund's office at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2.

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Two batches of mice (30 in each) were painted with the skin carcinogen benzpyrene twice weekly for eight weeks at which time 1 wart was visible. Benzpyrene treatment was then stopped. Thereafter one batch of 30 mice was not further treated and papillomas appeared in 14 mice over the next twenty-eight weeks. Each mouse in the second group was painted four times weekly with maleic anhydride from the end of the benzpyrene applications. After twenty-eight weeks papillomas had been observed in 5 mice only; 2 of them meanwhile regressed.

This is of great interest, for according to observation of the control group benzpyrene had in the first eight weeks done its work of carcinogenesis by causing 14 papillomas; yet these results appear to show that the reaction was then undone by the inhibitor. Another possible explanation given by Crabtree is that the malignant process was not yet complete when treatment with benzpyrene ended: some of the chemical may still have lingered among the cells, but by prior combination with SH-containing constituents, the inhibitor, although acting intermittently, made the successful linkage. Either the inhibitor became attached first or else it ousted the carcinogen. If reversibility of this linkage by inhibitors is suggested, rather than prior combination, the assumption must also be made that the inhibitor has the stronger combining power.

The claim of prevention by specific linkage, whatever the precise action may be, would be stronger had the experiment been allowed to run a longer course for a year at least. The argument of prevention of growth by deprivation of essential amino-acids can still be raised when only a few weeks are allowed for the tumour masses to become visible.

EXTENT OF THE NEED FOR REABLEMENT

EVERYONE now agrees that much more should be done to reable patients after illness or injury, but it is less easy to say just what facilities are needed for the purpose. The Liverpool Hospitals Joint Advisory Committee has produced a report[1] based on evidence from the medical staff of nine hospitals receiving between them medical, surgical, orthopædic, and maternity cases—the four branches of the Royal Liverpool United Hospital, three municipal general hospitals, and two voluntary special teaching hospitals. The survey covered all adult civilian inpatients, aged 16 and over, discharged from hospital during the three weeks March 5 to 25, 1945; children, Service patients, and chronic sick were deliberately excluded. Forms sent to the hospitals asked what type of reablement, if any, each patient required, under six headings—none, hospital outpatient, convalescent home, resident rehabilitation centre, non-resident rehabilitation centre, and Ministry of Labour training centre (i.e., retraining for a new occupation). Doctors were asked to assess patients' needs on purely medical grounds, as though the ideal situation existed in which every necessary kind of reablement could be had. This method naturally had drawbacks imposed by differences in the judgments made by the various medical officers and their knowledge of what reablement can do. The first drawback, however, could be discounted, since judgments tallied in the main; and the second had some value in reflecting the amount of use likely to be made of facilities when these materialise.

In 43% of the 2210 cases reviewed no reablement was thought necessary. The findings indicated that hospital authorities should be prepared to provide for reablement in the wards of 10% of general medical patients, who will thus need to occupy beds longer than they do at present. A much larger proportion of orthopædic cases—possibly 75%—will need bed reablement; but the survey covered only 175 cases, and it was felt that an effective estimate could not be made on so few. Some 15% of general medical and 10% of surgical cases were held to need outpatient reablement; and 50% of all surgical cases, 45% of gynæcological cases, and 30% of medical cases were thought to need 2½–3½ weeks in a convalescent home. Only 5% of general medical and 6% of surgical cases are believed to need special treatment at a rehabilitation centre, and most of them would be orthopædic and allied conditions, neurological cases, cases of hernia, and possibly neuroses. The demand for retraining at a Ministry of Labour centre was 2% for medical cases and less than 1% for surgical and orthopædic cases. Probably, however, such a centre might be used more than the survey indicates.

The report recommends further studies to decide the disposal of the many orthopædic cases needing reablement who are now leaving the wards, and to determine what exercises should be given to patients in maternity institutions, and what forms of outpatient reablement should be arranged.

1, The Demand for Rehabilitation and Convalescent Treatment. Report by a subcommittee including Prof. W. M. FRAZER, Dr. R. E. ROBERTS, Dr. W. JOHNSON, Prof. T. P. MCMURRAY, Dr. C. O. STALLYBRASS, Dr. H. WALLACE-JONES, and Mr. S. V. UNSWORTH. From the Liverpool Hospitals Joint Advisory Committee, 80 Rodney Street, Liverpool, 1.

VITAL STATISTICS

ACCORDING to the Registrar-General's return for the quarter ending Dec. 31, marriages in the whole of last year totalled 395,458, the highest figure since 1940, when 470,549 created an all-time record. The approximate reproduction-rate for 1945 was provisionally assessed at 0·916, or 8·4% below the full replacement standard which was so nearly attained in 1944, when the figure was 0·996 or 99·6%. In the December quarter there were 164,370 births, with a proportion of 1054 males to 1000 females. Deaths totalled 121,860. Infant mortality, provisionally corrected, was 46 per 1000 related live births, and was 6 below the average of the ten preceding fourth quarters.

Publication of population figures has been resumed, the estimated civilian population in England and Wales being shown as 39,111,000 last December. Corresponding estimates are given for counties and for large and small towns.

ON April 15 Lord Moran was re-elected president of the Royal College of Physicians of London.

Mr. H. S. Souttar has been re-elected president of the British Medical Association.

Mr. Arnold Walker has been re-elected chairman of the Central Midwives Board, and Mr. J. P. Hedley vice-chairman, for the coming year.

THE annual meeting of the Association of Port Health Authorities will be held in Edinburgh on May 28–30. The hon. secretary is Dr. H. C. Maurice Williams, Civic Centre, Southampton.

MIDWIVES released from the Services who have not practised for some time are to be offered a monthly grant of £15 by the Ministry of Health to enable them to attend refresher courses lasting up to three months. Alderman Charles Key, parliamentary secretary to the Ministry, announcing this plan at the Post-Certificate School of Midwives at Liverpool University on April 8, said that there are now about 16,400 practising midwives in England and Wales, some 10,000 of whom work in hospitals while 5500 are in the domiciliary services and the remainder are independent. Reckoning one for every 40 births, 19,000 midwives are likely to be needed in the coming year. To encourage candidates for training, special allowances in addition to pay are being made.

THE INDEX and title-page to Vol. II, 1945, which was completed with THE LANCET of Dec. 29, will be published with the issue of April 27. A copy will be sent gratis to subscribers on receipt of a postcard addressed to The Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

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Special Articles

UNITED NATIONS HEALTH ORGANISATION

L. RAJCHMAN
M.D.
FORMERLY DIRECTOR OF THE LEAGUE OF NATIONS HEALTH SECTION

INTERNATIONAL technical collaboration should be based on direct contacts between those who have constitutional and technical responsibility in their spheres of action. Just as in the United Nations Security Council the foreign ministers themselves take part in the discussions and decisions, in an international health organisation the ministers responsible for public health and social welfare should be able to meet together and to give the necessary leadership. This is all the more necessary at present when problems affecting the health of the nations as well as problems of population are, at long last, a major preoccupation of the governments of all civilised nations.

The ministers would act on the advice of their principal medical officers, who must likewise be brought together periodically. Finally, any policies to be adopted by the United Nations in the field of public health should have the sanction of "consumers of health"—i.e., those for whose benefit the various measures are being contemplated.

THE NEW STRUCTURE

To achieve the above ends a United Nations Health Organisation should be composed of three standing organs:—

(*a*) A committee of ministers of health.
(*b*) A standing health committee composed of chief medical officers of health and of chairmen of the standing technical commissions.
(*c*) A general assembly composed of representatives of social-security organisations (in accordance with the several national types of agencies), of representatives of academies of medicine, and of Red Cross societies and other responsible voluntary agencies.

Since the Economic and Social Council of the United Nations is composed of 18 nations, elected by the United Nations Assembly, and since the terms of reference of the council are to coördinate the activities of the various technical agencies of the United Nations, the simplest solution would be for the same 18 nations to delegate their ministers of health, and chief medical officers, for the two standing committees. The Health Assembly, however, would have to represent all the member states of the United Nations. The assembly would meet once a year at a date so chosen that their report would be available for the annual General Assembly of the United Nations. The ministers of health should meet at least twice a year immediately after the session of the Standing Health Committee. This committee would appoint a smaller group as an executive board to direct the work of the organisation. The Health Committee would appoint a number of standing permanent commissions dealing, for example, with biological standards, malaria, tuberculosis, medical education, colonial medicine, and sanitary conventions, and the chairmen of those various standing commissions would ex officio be members of the Health Committee. This privilege need not be extended to chairmen of ad-hoc technical commissions set up for a short time.

The general director of the organisation would be appointed by the Health Assembly on the nomination of the committee of ministers, acting on the advice of the Standing Health Committee.

The finances should be derived from two sources:

(*a*) Administrative expenses covering salaries and the usual overhead should be provided out of the general budget of the United Nations Organisation so as to enable the General Assembly of the United Nations to exert control over executive officers of the Health Organisation.
(*b*) An annual appropriation for technical and research work to be provided out of a special United Nations Health Fund.

All of the members of the United Nations should be called upon to contribute to a fund of 100,000,000 U.S. dollars on the contribution scale agreed on for the International Monetary Stabilisation Fund. The $100,000,000 would be invested in bonds issued by the International Bank at 2½%. The fund would be administered by a board of trustees elected by all the contributors, under a chairman and director appointed by the chairman of the General Assembly of the United Nations. The board of trustees would appropriate sums provided for technical and research work on the recommendations from the Standing Health Committee.

The board of trustees would also award annually a prize for the outstanding achievement or outstanding research in the field of public health in the widest sense of the word. The award would be made by the chairman of the General Assembly at a public meeting.

EXISTING ORGANISATIONS

There remains the question of how best to utilise the existing international health organisations.

The files and the plentiful documentation of the health section of the League of Nations secretariat will no doubt be taken over by the new organisation; and so will the few remaining members of the technical staff.

The Office International d'Hygiène Publique should also be incorporated in the new organisation provided (1) that its staff is internationalised, and the proviso that the director must be French is eliminated, and (2) that English as well as French is an official language. The Office ought to be utilised as a standing technical commission on sanitary conventions and also as a standing annual conference of directors of public-health services on the model of the conference in the Western Hemisphere which proved so fruitful.

The Quarantine Council of Egypt, as well as the Near Eastern Epidemiological Branch, should be subordinated to the new organisation and should report through the Paris Office.

The Pan-American Sanitary Bureau and the Inter-American Liaison Organisation should have the status of regional offices to which the Health Organisation of the United Nations delegates all, or part, of its authority. Similar arrangements would have to be made in regard to the Far East and the South Western Pacific. The Singapore bureau should be revived under the new organisation to provide epidemiological intelligence for maritime traffic. But an additional bureau should be set up at a key centre of civil air navigation to deal with the much more important problem of sanitary control of air traffic. Indeed, it will be necessary to establish many such bureaux, in Africa, the Middle East, and the Far East. There should also be, preferably at Shanghai, a regional office to deal with all problems within the competence of the Health Organisation.

OTHER SERVICES

Finally, two administrative services might be established without much delay on an international basis—namely, a Sanitary Inspectorate of Intercontinental Air Traffic and a Consolidated Colonial Medical Service.

The sanitary inspectorate should consist of a small team of highly skilled epidemiologists and public-health administrators, fully conversant with sanitary conventions, who would periodically visit the various air-traffic-control bureaux and advise on measures against the propagation of disease.

As to the colonial services, all countries having overseas responsibilities find it extraordinarily difficult, if

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not impossible, to recruit adequate technical personnel; their objective is to train indigenous technicians in all the branches of public health and medicine, but pending the establishment of medical services in dependent territories manned by native staffs, the widest and closest collaboration should be established between the existing colonial services so as to utilise all the available national facilities for the common end. A commission representing the interested services should be set up without delay to make definite proposals.

The war has demonstrated that medical research organised on a large scale, and based on multivalent team-work, will produce vitally important results. Even better results would be obtained if similar methods were applied on an international scale, thus integrating results now being reached separately by the several nations. An International Institute of Medical Research should be established for this purpose under the Health Organisation, to be financed out of the United Nations Public Health Fund as well as from special endowments.

NUTRITION IN EUROPE

IN Europe today the majority are hungry, many are underfed, some are malnourished, but, thanks largely to UNRRA, few are starving as yet. These conclusions were given by Dr. A. P. MEIKLEJOHN, chief adviser on nutrition to UNRRA, at a press conference in London on April 11.

Yugoslavia, he said, with a population of 15 million, normally has a grain harvest of 8 million tons, but last year it was only 4 million tons. Indigenous production now allows 1600 calories a day, but transport difficulties prevent an even distribution. Distribution in the eastern part of the country has been well organised, but in the west the position is difficult, with 3 million people totally dependent, and a further 2 million partially dependent, on UNRRA. The people are subsisting mainly on grain, peas, and beans, and a fair calorie intake is being achieved, though the diet lacks fat. No reports of a serious incidence of famine diseases have been received, but there is some severe rickets, due to milk shortage. In normal years Yugoslavia produces four times as much maize as wheat, and supplies of nicotinic acid have been accumulated in anticipation of an outbreak of pellagra in the coming summer. Of protein, enough for 56 grammes a day is available from indigenous sources, and with imports the total is brought to 77 grammes. Some districts are inaccessible, and there may be evidence of protein deficiency before the harvest.

Austria.—Last June no rations were issued, and from June to September rations accounted for 800 calories only. At the end of September famine œdema began to appear. From then until November the issue was maintained at 1550 calories, but since then it has fallen, chiefly through failure of the potato crop. Vitamin-C tablets have been distributed in the British zone of Vienna since January. By the first week of March the ration was yielding only 1310 calories, and in the middle of that month it was officially set at 1200 calories. Hitherto, there has been no unrest or serious incidence of disease, but sporadic cases of famine diseases are now appearing in the hospitals. Children in Vienna are receiving a fair diet of about 1000 calories a day with some additions from voluntary organisations, but there is real hardship among the aged. The infant mortality, which last July was 355 per thousand live births, is now about 130.

Germany.—In the British and French zones, the rations in February provided 1500 and 1330 calories respectively. The ration has now fallen to the 1000-calorie level in the British zone, and is only slightly better in the French. In the American zone, indigenous resources suffice to provide 18 million inhabitants with 960 calories a day, and the total calorie value of the diet there is probably about 1920. In the British zone there has been no important incidence of nutritional diseases, but these may appear soon.

Of all these areas, Austria, and particularly Vienna, will, in Dr. Meiklejohn's opinion, be the greatest problem in the coming months. The situation there causes grave concern.

TUBERCULOSIS IN CANADA

FROM OUR OWN CORRESPONDENT

THE death-rate from tuberculosis in Canada has fallen from 52·8 per 100,000 in 1939 to 48 in 1944. The province of Saskatchewan, with 26·4 in 1944, shows the lowest mortality; and Ontario's rate is practically the same. The Canadian Tuberculosis Association is beginning to realise the hopes upon which it was founded, and is receiving governmental and public support that enables it to enlarge its efforts to control the disease. Full-time provincial secretaries of the association are at work in each of the provinces except New Brunswick and Nova Scotia, which are expected soon to appoint such officials and so complete the organisation of antituberculosis work in the dominion. Shortage of beds in sanatoria is already a problem. This will soon become acute as the widespread case-finding campaign proceeds. Shortly after war was declared the Canadian Tuberculosis Association suggested radiographic examination of all recruits to the armed forces. This was done, and the feasibility of examining whole communities was demonstrated.

In *Ontario*, one 4″ by 5″ X-ray unit was sent out in 1942; shortly afterwards two additional units were put into operation, and in 1945 a 70 mm. film unit was introduced, which does the work at a reduced cost. The first group to be examined in Ontario were school-teachers, university and normal-school students, and the working staffs of some 250 industrial firms. In the four years ending last December, 305,000 persons were examined, and pulmonary tuberculosis, active or inactive, was found in 3217 or 10·6 per 1000 persons examined. Of these, 465 or 1·5 per 1000 were found to have active disease requiring treatment. The programme has been enlarged by the department of health aided by the Kiwanis and other Service clubs, and a newly formed Ontario Tuberculosis Association, with thirty or more local committees. Eleven communities have been surveyed during the past year, and fifty is the objective for 1946. In Toronto the Gage Institute in coöperation with the Toronto department of health has undertaken to make chest films of all persons in the city and the county of York, who number over a million. This movement began in November, 1945, by the mayor and aldermen of the city submitting to examination. The machinery is geared to handle 400,000 individuals each year. All pupils in secondary schools are being examined; up to March 15, 1946, 20,000 of them have been X-rayed and 13 cases of active tuberculosis found. The incidence so far is 0·7 per 1000 among school-children and 1·3 among civic employees. A new 70 mm. transportable X-ray machine, which takes 400 exposures on one roll of film, is being sent out to industrial plants and other strategic points. Loss of time is thus minimised.

The Tuberculosis Association of *New Brunswick* is planning the purchase of a mobile X-ray unit to conduct a mass survey of the population. This unit will work in coöperation with the provincial department of health.

Alberta has already given 1 in every 8 of its people the benefit of an X-ray examination of the chest.

In *Saskatchewan* 125,568 persons were examined in 1944, in addition to 23,204 suspected persons who were examined at sanatoria and clinics. By the end of 1945 seven of the eight cities of the province had had a complete survey. During 1946 three photofluorographic X-ray machines, each capable of examining 1000 persons per day, will be at work in the summer months. Away up in the Peace River district people came to the examination centres from distances up to sixty miles, using horse and wagon or canoes for transport.

In *Nova Scotia* the movement is gathering momentum; in Halifax 13,000 school-children are to be examined early in the year.

A darker aspect appears in the report of a commission on nutrition of the bush Indians in northern *Manitoba*; the death-rate from tuberculosis among these people is now 7·82 per 1000. This state of affairs has aroused the federal department of health. It appears to be primarily a result of malnutrition and overcrowding in the small cabins that have replaced the tepee as winter quarters.

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Health Centres of Today

VI. TOTTENHAM

G. HAMILTON HOGBEN
M.R.C.S., D.P.H.
MEDICAL OFFICER OF HEALTH FOR TOTTENHAM

IN the immediate pre-war years the borough of Tottenham, a densely populated urban area of 144,000 persons, commenced a programme of erecting new municipal health centres to serve units of 20,000 population; these were designed to meet the needs of an increasingly popular and expanding personal health service for women and children under the statutory powers given to local education and welfare authorities. Two such additional health centres were completed in 1938–39, providing a full range of clinic services required by the maternity and child-welfare and school health departments, at a cost of £15,000–£20,000 each. Plans for a third centre had to be indefinitely postponed on the outbreak of war.

The two centres so far erected are built of brick, and are combined with day nurseries for the care of 50 and 40 children between the ages of nine months and five years, belonging to mothers who go out to work. Each centre provides the following clinic services: antenatal, postnatal, gynæcological, infant-welfare, toddler, artificial sunlight, dental with orthodontics, orthopædic with remedial exercises and physiotherapy departments, eye with refractions and orthoptics, ear, nose, and throat, immunisation, rheumatism, nutrition, speech therapy, and child guidance. In addition, they both have facilities for health education (mainly by visual methods), parentcraft training, parents' clubs, and cookery and dietetic demonstrations. In the layout of the sites, ample scope was given for experiment.

NEIGHBOURHOOD HEALTH CENTRE

The first to be described is a bungalow type of building with a south-westerly aspect, placed well back from the road and with a number of trees in the foreground (figs. 1 and 2). Special attention has been paid to cross-ventilation with 'Ventilock' windows along the whole length of two sides of the nursery playrooms. An outside nursery for infants in cots is provided on the roof of one wing. The toddlers have a glazed verandah outside their dining-room, beyond which is a grass plot fitted with a sand-pit, paddling-pool, and climbing frames. Heating throughout the building is by means of twin low-pressure hot-water boilers with automatic stokers. The radiators are of the 'Neo-hospital' type, recessed into the walls, while the playrooms, artificial sunlight room, and bathrooms are heated by 'Rayrods' incorporated in the ceilings. The hot-water supply to the laundry and disinfector is separate from that to the basins and sinks, which do not need such high temperatures.

Special attention has been paid to the floor covering, which varies with the purpose of the room. Rubber flooring is laid in all the children's playrooms, and impervious composition flooring in bathrooms, lavatories, and dental and minor ailment clinics; the corridors have wood-block flooring.

In the central wing, projecting from the rear of the building, there is a lecture waiting-room, equipped with fixed blackboards and a roller cinema screen. The nursery kitchen opens into the lecture hall for cookery demonstrations. As far as possible, all cupboards and clothing lockers are built-in, as also are the cork-faced notice boards for poster displays and the glass-faced exhibition cabinets. The dental clinic has a window of the surgical operation type with a curved top light. The toilet racks in the toddlers' bathroom of the nursery are of aluminium-covered plywood, divided into compartments for each child, with a hole for the tooth brush, which is covered by the beaker. The water-supply to the infants' bathroom is foot-controlled, and the temperature of water to the two pedestal basins is governed by a thermostat. Children's outdoor clothing is stored in metal wire mesh lockers over hot-water pipes. Ample covered accommodation for perambulators is provided along the sides of the building.

COMMUNITY HEALTH CENTRE EXPERIMENT

The second health centre, also of brick construction and bungalow type, was purposely sited alongside the local authority's open-air swimming pool, attached to which is a municipal restaurant and sun-bathing area, with a large recreation ground beyond. Youth community services are provided in the evening in a modern senior school built on the site in the same year (1938), the whole being contiguous with a large municipal housing estate, for which it provides social amenities. In addition to a day nursery and a full range of clinic services, this centre accommodates the administrative offices of the school health service for the borough.

Health centres of this sort seek to provide social and educational amenities in addition to facilities for periodic health inspections and medical advice. Local health authorities wishing to make similar provision will no doubt seek to combine with local education authorities intending to build community centres under the Education Act, 1944. The public would then be more likely to coöperate in periodic health overhauls, which are necessary for adults as well as children, under conditions where each member of the family visits the community health centre for its social, educational, and recreational attractions, irrespective of the benefits conferred by health inspections and advice on health matters.

FUTURE USE OF EXISTING HEALTH CENTRES

The conception of a health centre as we have known it in the past is very different from that implied in the new National Health Service proposals. The stress now is upon the curative aspect, though this does not necessarily exclude an ultimate intention to bring the prevention of disease and promotion of health into full partnership with medical and surgical treatment. Indeed, the very title, National Health Service, suggests a recognition of the present-day trend in all fields of medical science

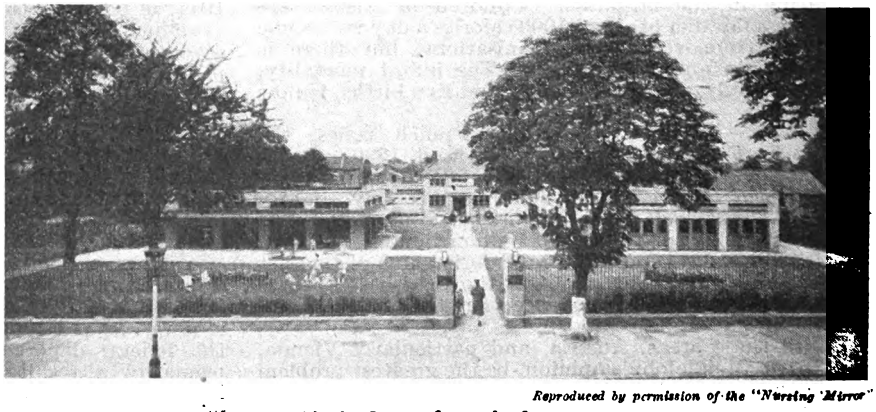

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Fig. 1—Centre from the front

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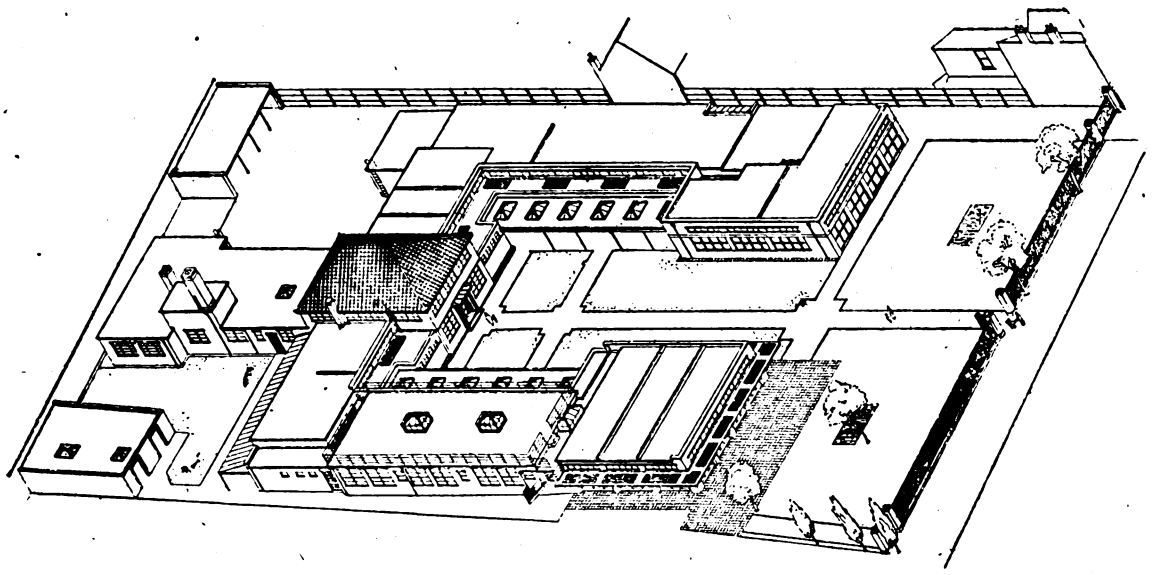

Fig. 2—Axonometric view of Centre

to pass from the defensive to the offensive, and to aim at optimum standards of physical and mental capacity in the individual, both in sickness and in health. The gap which has so long existed between prevention and cure can be permanently bridged, and local health authorities may in the future develop both types of provision side by side in common health centres which would offer all additional amenities necessary for the new family-practitioner service.

In the planning of health centres for the borough of Tottenham, another type of health centre was envisaged—namely, a central health centre or polyclinic sited in close proximity to the Prince of Wales's General Hospital. The scheme submitted to the hospital planning committee early in 1942 included the following features.

Designed to serve the smaller and less lavishly equipped neighbourhood or community health centres in the town, and, if thought advisable, those of adjacent districts, it was to be staffed and equipped to give full facilities for the early diagnosis of disease, and to provide a complete range of specialist diagnostic clinics. With at least two stories, the central centre was to be of permanent brick construction, if only for reasons of economy of space and relatively low upkeep costs. Here the family doctors, as also the public-health officers and medical auxiliaries normally working at the periphery, would get opportunity for postgraduate training in intimate contact with the hospital consultant and the North East London Postgraduate College attached to the hospital.

With associated development of hospital teaching departments in child health, industrial health, and social medicine, increasing scope would be given, through the medium of the central health centre, for linking these specialist services with work in the field, and thus encouraging organised and planned research into medical and social problems. At such a centre, hospital almoners would have increased opportunity for observing social influences on healthy living as well as the effect of environment on the treatment of disease and rehabilitation of the sick and injured. It was realised that this conjunction of health workers of many sorts would result in an increasing amount of medical and health data, which, if properly correlated, could supply a more complete local audit of community health than has been possible in the past. For this purpose, it was proposed to set up a medical intelligence service and statistical department at the central health centre, equipped with all necessary modern mechanical aids for sorting records and tabulating the results. This department would serve the hospital, family practitioner, and public-health services of the district.

Towards Social Security

Offsprings of the Statute-book

ONE of the hindrances to an understanding of the law on any topic is the multiplicity of documents that seem to bear on it. The key to this particular puzzle is held by him who has a sufficient understanding of the structure of the law, or the broad classifications into which the various documents fall.

One method is to visualise the groups as if they were geological strata, the top layer having the superiority of the statute-book, the next layer being orders-in-council, the next regulations, and so on. It would be easier to regard the statute as the parent, the order-in-council as the child, and the regulation as the grandchild—but for the biological inconceivability of cases in which one generation is omitted altogether, as when regulations are directly appended to an Act.

To return, then, to the top layer—the Acts of Parliament—it must first be noted that no Act can be taken entirely by itself. The Interpretation Act, 1889, applies to all Acts passed since that time, and its terms are illuminating. Again, if the provisions of an Act are inconsistent with those of a former Act, the old one is impliedly repealed to the extent required to enable the new one to operate. In other words, the statute-book is interpreted as a single code and not as several unrelated parts. It is not without reason that an Act of Parliament does not receive a serial number but is described as a "chapter" of a continuous book.

Orders-in-council, made nominally by the King on the advice of his Privy Council, follow a stately routine as befits their sonorous title. They carry the collective responsibility of those Cabinet Ministers summoned for the purpose. These orders-in-council rank equally among themselves but are subordinate to statute law and nowadays operate only so far as they may be authorised by statutes.

Regulations and orders of a particular Minister come one stage lower down, and are a degree easier to understand—sometimes. Practice varies as to what shall be called "regulations" and what shall be called "orders"; but these instruments are usually more or less equal,

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and none of them would exist but for some power expressly conferred on the Minister by an Act of Parliament.

From what has been said, it might be thought that from time to time a regulation or order would be challenged in the courts as being beyond the Minister's powers and therefore invalid. Such a state of affairs would be extremely inconvenient because not only the Minister but other people would hesitate to take decisions under a regulation if there was a risk of its vanishing into thin air. So the ingenuity of the draftsman finds a way of putting these regulations beyond challenge. The governing statute does not say "the regulations shall be valid whether or not they go beyond the powers conferred by this Act." The statute simply says "the regulations shall have effect as if enacted in this Act." The theory is that this at once raises the status of the regulations to that in the statute, where the sovereign power is unlimited.

Parliamentary Ways

Every conscientious citizen should, at least once, observe the Mother of Parliaments in action. The casual visitor, finding himself in Westminster with a few hours to spare, can sometimes gain admission to a public gallery without even the formality of sending in a green ticket to his local Member and waiting in the central lobby. Unless a popular debate is in progress—when the queue becomes very long—a visitor taking a seat in St. Stephen's Hall between about 4 P.M. and 9 P.M. Monday to Thursday will, in due time, find himself accommodated in the gallery, merely signing his name to promise good behaviour. On Fridays, when application can be made from about 11.30 A.M. until about tea-time, it is often possible to gain admission within twenty minutes.

An announcement of the business planned for the following week can usually be found on Friday in the *Times*, Parliamentary page, and may be repeated on the Monday in the first column of the leader page. Even when the demand for the public seats is heavy, an early telegram to a Member has been known to produce a ticket.

But interesting things also happen "upstairs," as they call it, in the committee stage of a Bill. The committees, which usually sit from 10.30 A.M. to 1 P.M., are open to the public; but so little is this known that, generally speaking, one can find a seat at any time. By persistent inquiry of policemen and officials, the visitor will eventually be directed to the appropriate committee room and can there observe the Government spokesmen and the Opposition at close quarters on the clauses of a particular Bill. The proceedings are more concentrated than those in the House itself, because Members do not take up time with long speeches designed only for the delectation of their constituents when reprinted from *Hansard*. It is true, of course, that committee proceedings are printed and published (6*d*. a time) in the same manner as daily reports, but there is no wide circulation. It would not be right, of course, to imply that all the tremendous issues of affairs of State are settled by equable weighing of merits in open committee. Much depends on discussions that have taken place elsewhere and on the general consensus of opinion that has emerged in interested quarters, finally dominated by the philosophy of the party in power. The business of Government in a democracy is to govern with the consent of the people, and much care is exercised by Government departments to see that if a Minister is running counter to the general stream of interested opinion, he is at least doing it with his eyes open.

A departmental chief who may be trenchant and dogmatic on the public platform is often adroit and conciliatory in committee. On the other hand, there is the kind of Minister who has ruined his promising career by a dull obstinacy at the crucial moment. In the complexities of modern life the successful politician is not the one who achieves such original thinking but the one who knows how to survey his opportunities with a right sense of priorities and also how to use his talented officials and just when to overrule them. Occasionally the array of officials mustered in a committee room during a debate produce their pieces of advice only to find the Minister rising to reply before he can receive it from the lips of his parliamentary private secretary. The nakedness of the land may then become apparent—or it may be skilfully concealed. Of course, a Minister can rise from his place and walk to the officials' bench for a close consultation in the sight of all; but this technique has the disadvantage that he may appear discourteous or unheeding to the Member then on his feet. If the Member happens to stop or to beg that the Minister will give him a hearing, the Minister will scuttle back to his place and look politely attentive; but, being deprived of the full benefit of his consultation, the final answer may not be as good as it should be. The most significant utterances are often extemporaneous.

JUSTINIAN

On Active Service

AWARDS

Major GEOFFREY PARKER, D.S.O., F.R.C.S., R.A.M.C., has been awarded the Croix de Guerre with gilt star.

MENTIONED IN DESPATCHES

R.A.M.C.

Brigadiers.—H. L. G. HUGHES, C.B.E., D.S.O., M.C., A. E. PORRITT, C.B.E.

Colonels.—I. T. FURNIVALL, D.S.O., W. A. ROBINSON, O.B.E., R. W. FAIRBROTHER.

Lieut.-Colonels.—W. M. ARNOTT, J. H. BOLTON, C. L. BROOMHEAD, J. CLAY, P. COLEMAN, T. H. CROZIER, G. V. DAVIES, T. H. DOCKRELL, A. L. EYRE-BROOK, A. H. HALL, L. H. HOWELLS, A. F. KENNEDY, O.B.E., J. C. LINDSAY, M. J. LINDSEY, M.C., M. MARKOWE, N. H. MARTIN, T. MOORE, R. J. G. MORRISON, F. MURGATROYD, E. A. L. MURPHY, J. W. OSBORNE, W. M. OXLEY, G. D. PIRRIE, C. B. PROWSE, W. A. McD. SCOTT, J. SHIELDS, C. de V. SHORTT, R. A. SMART, R. A. STEPHEN, J. P. STEWART, W. STEWART, M.B.E., A. D. YOUNG, D.S.O.

Majors.—J. MacC. AIMOND, E. McL. BARBOUR, J. BORROWMAN, R. Y. BULLOCK, A. A. BYRNE, M.C., G. G. COCHRANE, H. H. COLLIER, J. L. COLLIS, R. C. CUNNINGHAM, G. H. DARKE, W. N. DARLING, F. R. DENNISON, W. N. DOUGLAS, E. H. EVANS, J. A. C. FLEMING, R. GLANVILL, G. GREGG, H. HALL-TOMKIN, A. B. HAMER, E. R. HARGREAVES, J. M. HARKER, M.B.E., J. C. HARLAND, G. J. HARRISON, S. T. HENDERSON, J. A. HEWITT, S. HOWE, W. HYNES, B. F. LONGBOTHAM, J. E. MARQUIS, R. J. MILLER, W. G. MILLS, C. R. MORGAN, R. T. NICHOLAS, D. J. PADDISON, K. D. G. REID, I. B. REES-ROBERTS, J. A. ROSS, J. E. ROYDS, G. R. ROYSTON, G. SANDERS, R. S. THOMPSON, M. TOOHEY, A. M. WADSWORTH, F. R. WALDRON, J. WATT, M.C., L. R. WEST, H. F. WHALLEY, A. R. WILSON, M.C., J. W. WISHART, W. J. CHRISTIE, H. S. LANCELEY.

Captains.—E. ANDERSON, J. ANDERSON, J. D. BINNING, R. BLACK, J. N. BLAIR, F. M. BRAINES, J. M. CHILDS, S. CONLAN, P. J. CREMIN, W. R. CUNNINGHAM, M. W. DAVIES, R. D. DEWAR, A. H. DICKIE, W. K. DOUGLAS, A. R. FORD, W. G. FRENCH, T. GIBSON, W. N. GIBSON, D. H. GIRDWOOD, M. B. GRAHAM, A. HUGHES, R. T. KIDDIE, H. W. LEES, R. LEVY, M. P. LEWIS, N. A. LEWTAS, E. MACLAINE, O.B.E., A. D. MACRAE, J. D. McCARDEL, R. C. McLAREN, T. H. MEEK, C. MILNE, J. F. O'NEILL, G. W. PIMBLETT, D. P. POTTER, E. J. T. PRETTEJOHN, D. H. RHIND, P. M. RITCHIE, T. T. ROMANS, O. C. SANDYS, W. M. SMITH, D. N. STUART, J. H. TASKER, J. R. TROUNCE, I. McC. TROUP, H. B. S. WARREN, P. F. A. WATKINS, C. J. L. WELLS, W. F. WHITE, O. P. G. WHITFIELD, I. A. WILLIAMS, W. K. YOUNG, W. H. FRANKLIN, J. WILSON.

Lieutenants.—J. G. S. BURTON, F. A. DONNITHORNE, S. B. FLETCHER, K. D. POULTER, W. A. REYNOLDS, K. L. TAYLOR, A. H. TOTTLE, C. WEIB, S. J. WINDSOR.

R.C.A.M.C.

Lieut.-Colonels.—F. S. BRION, W. M. COUPER, J. M. SPENCE.

Majors.—H. W. FISH, E. W. FLAHIFF, SAMUEL HANSON, E. A. LOVELL, A. B. SINCLAIR, E. G. SPOONER, C. R TRASK, K. J. R. WIGHTMAN, ROBERT COWAN, R. MacK. TAYLOR.

Captains.—J. B. BENSON, R. F. BOETTGER, R. L. P. BROSSEAU, M.C., B. W. CASSELMAN, J. N. CUNNINGHAM, THOMAS DALRYMPLE, R. E. FISHER, J. H. S. GEGGIE, JOSEPH GREENBLATT, J. E. HOWES, SAMUEL KLING, G. B. McCALL, J. S. S. MARTIN, S. M. MEDINE, J. K. MORRISON, R. D. OATWAY, J. E. G. SOUCIE, J. B. TINDALL.

Lieutenant D. P. MELVILLE.

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In England Now

A Running Commentary by Peripatetic Correspondents

THAT ten days' locum at the San was an idyllic affair! The sun shone, the clustered daffodils held nodding conference, the birds an eisteddfod, and the patients lay out on the verandahs. There was a happy atmosphere and everybody was playing the healing game—filling up the spaces that the enemy had devoured, making scar tombstones for lost alveoli, squashing the holes which Nature and Man abhor but the T.B. and his pyogenic pals seek to make vaster. Dozens of pneumothoraces, a fifteen or two of phrenic cuts or crushes, a couple of air-bellies, an eleven or so who had had their strings cut, Man with Nature's aid was playing this game of squash right merrily, and the patients, most of whom had seen service in Crete or France or Africa or Burma, or had been prisoners of German supermen or Japanese inframen, were fighting in yet another campaign with tenacity and zest.

But there was one thing that made me profoundly unhappy. A few of them have holes that cannot be squashed by the methods employed in the San. A thoracoplasty is the only thing for them and it can't be done because the surgical facilities are lacking. The sound lung may not stay sound for long; an ominous stream of malignants passes its portal day and night. I feel very selfish about this because seventeen years ago I came back from sea with a big hole in my lung which was quickly and skilfully squashed at the Brompton by this slightly intimidating but really fairly superficial moulding, since when I have never had a day in bed from it. Surely, surely we can bring the same urgency to the campaign these warriors are waging that they gave to all of ours, and succour them without stint against the most lasting enemy.

* * *

A friend has lent me some family letters telling of an operation by Liston. The patient, Robert King, who was twenty-eight at the time, fractured his fibula in 1830 and was left with a sequestrum. He went to see Liston on the morning of Aug. 29, 1843, and here is an account of what happened by his brother, a medical student.

My dear Father,

You will rejoice with us to hear of the complete success of the operation, for which I trust we are all deeply thankful. I will begin with our visit to Mr. Liston at 11 A.M. After probing the opening at the ankle he introduced a screw probe (from his waistcoat pocket) which by 2 or 3 turns fixed itself in the sequestrum (or dead bone) and then by slight traction he was able, by the hold it had, to move it up and down slightly. . . . He then gave a decided opinion as to the possibility and advantage of operation. His businesslike manner delighted Rob^{t}., who was quite at home with him. He asked Liston 2 or 3 questions as to the operation and then left in high spirits fixing to be ready for it at half past one. Taylor also was as much pleased and from the comparison with Sir B. Brodie said he should send patients to Liston in future.

Mr. Liston arrived at a ¼ before 2. Rob^{t}. then ran upstairs and put on drawers and his easy coat and took a seat on a chair (water, sponges and oil silk having been made ready). In a minute after Liston (and Mr. East, Camps, Taylor and self) was up with him, and having laid his leg before him on a chair covered with a sheet of oiled silk, he at once began, sans ceremonie, (having first introduced a probe) by making a longitudinal incision, with a small bistoury, to the extent of 4 inches along the fibula and ending at the outer ankle. The edges were slightly freed from the bone and a fissure about ½ an inch long at once appeared. The dead bone was at once seized by the forceps and now the great length of the sequestrum became apparent, for the attempts to push it up and down as you would a pencil in its case produced an eddying of blood at the opening in the calf. Repeated but ineffectual attempts were made to cut thro the new bone with cutting forceps (Liston's) but the space was so limited that they could not well be introduced. At last (after near 20 min.) a separation was effected by alternately prizing with the lever and crushing and breaking with the forceps, and now the lower fragment about 2 inches long was drawn up. The movement of this gave exquisite pain, probably from the lower end touching some nerve, and its removal will probably be the last of that neuralgic pain at the ankle from which he has suffered so much.

But now a word for the patient; he had been grasping my hand and laying his head on my shoulder, raising it every moment to see how things went on. He never uttered a complaint except when the violent efforts were made to remove the lower fragment. After the first 20 min. he asked for a moment's rest. He now grasped his own leg while I held aside the lips of the wound. The suffering was less acute and now he took as much interest in looking on as any of us, and I might almost say enjoyed it—which as seeing the happy result at hand was I believe no more than the truth. Indeed he quite encouraged us all, telling us "stratagem was better than force," &c., &c. Liston was not prepared for so much difficulty and said he never before met with it in the like.

The operation consisted in prolonging the incision upwards nearly 2 inches and continuing the same with the forceps and cutting pliers; an incision of 1½ inch was also made in the calf as a sort of feeler, but that was not made use of. At the end of 40 minutes all the sequestrum was brought, and after washing off the blood (which was scarcely 2½ ounce) and filling the chasm (which would hold 2 or 3 fingers) with dry lint, lint wet in warm water was laid over it. He hopped to the sofa and there sits with his leg raised before him on a hard pillow, with only slight aching pain, such as if he might have been much pulled about.

Subsequent letters tell how the patient went on. The wound oozed considerably, and towards evening Robert had an attack of faintness which he put down to Taylor coming in with a cigar in his mouth, and which Robert's mother attributed to "the dear boy in the fullness of his joy" being a little too talkative. He had a restless night, but next day his pulse was only 76. Liston came at half past one, and "was merely cutting his nails on a chair by the bedside for a minute or two while the sheet was raised from the cradle." He allowed Robert chicken soup. Some excitement was caused by the disappearance of the pieces of sequestrum which an unwarned maid had thrown down the kitchen sink. Robert declared he wouldn't have lost them for £50, and luckily George Davis, the surveyor, dropped in and very amiably retrieved the missing fragments. The patient ran a temperature for a day or two, but after that he rapidly graduated from chicken broth to beefsteak by way of turbot, and was soon drinking near a pint of ale with his morning chop—a diet well qualified, as his uncle Alfred remarked in a letter to him, to fill up Liston's hole. At Liston's last visit he is reported to have "turned the pea out of the issue with his probe." This is the first and only mention of the pea, presumably an issue-pea, "a pellet of orris root, ivy wood, or other material used in making and maintaining an issue," as *Dorland* explains. On Sept. 9—eleven days after the sequestrectomy—Robert travelled home to Reading, going by coach to Paddington and the rest of the way by train. Liston's bill for the operation and several subsequent visits was £25.

* * *

We have the Cabinet ministers out here now, attempting the heavy task of convincing the various parties of Indians that there is nothing we want more in India than to see them independent. All Indian propaganda for the past 50 years has been based on the principle, "We don't care what the British say, for they don't mean it"; and they are naturally finding it a little difficult to assimilate the notion that perhaps this time we really do want to shuffle off the Indian coil. The more astute Hindu has got there first, and great efforts are being made to see that British raj is replaced by Congress raj—a bad thing, for when the slower-witted but sturdier Moslems wake up to what is happening, there may easily be a lot of bloodshed, with ourselves in the disagreeable rôle of keepers of the peace in a country that is no longer our responsibility. So far as the elections go, and with the very limited franchise and corrupt voting that isn't very far, things seem to be hardening down to a clear issue between Congress and the League, both of which have gained seats in different provinces, at the expense of the smaller parties. I think "optimism" in connexion with Indian affairs may only represent the hope that trouble will come *after* we have ceased to be responsible for the country, and not *before*.

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Letters to the Editor

THE SHORTAGE OF STUDENT NURSES

SIR,—Nursing has some inevitably unattractive features, such as night duty; but student nurses are still required to tolerate hardships which are not, in my view, necessary.

The correction of two complementary training difficulties would help recruitment. They are: (1) a girl leaving school cannot usefully begin training until she reaches the age of 18; and (2) during training she is expected to nurse in the wards, to attend lectures, and to study for examinations. The first of these difficulties gives rise to the problem colloquially known as that of "bridging the gap." The second is one which doctors, looking back on their student days, should be able to appreciate. Both difficulties can be overcome by the following scheme:—

(1) The establishment of training colleges, to which girls would be admitted (as residents, or as non-residents if living nearby) when aged 16.
(2) The course of training for the preliminary State examination to be given in the training college. This would house a model ward, but practical training would be supplemented by practical demonstrations in neighbouring hospitals. Students would take their preliminary State examination from the college.
(3) After passing the preliminary examination, students would remain in the college for a further period (? 3–6 months) for theoretical and practical instruction in the broad outlines of the syllabus for the final examination. Hospital demonstrations would be continued.
(4) Students would enter hospital at the age of 18 or over, having passed the preliminary examination, and having had some instruction in the subjects of the final State examination. They would do nursing duties in the wards and other hospital departments, and would receive tuition in the course of their daily work. Supplementary lectures during this period could be limited to one per week.
(5) If thought desirable, students could return to the college for a short period before taking their final examinations.

This scheme appears to have the following advantages:

(1) It bridges the gap.
(2) It removes the hardship of combining ward work with intensive lectures and study.
(3) It does not involve any reduction in the number of students now available, but prepares the present 16-year-olds for practical training.
(4) It provides hospitals with student nurses who, on entry, have a fairly considerable background of training and knowledge.
(5) It involves no departure from the high standard of training which, in my view, is rightly required of nurses.

The plan is essentially an extension of the accepted idea of a preliminary training school. Students whose performance, after a reasonable probationary period in the college, is unsatisfactory could be advised to take training as assistant nurses. A month's carefully selected hospital work might be included in the early part of the training; this would obviate the risk of a girl spending 18 months or more in the college only to find that she was not attracted by practical work.

The General Nursing Council would have to decide the period of practical experience required before candidates could enter for the final examination. I believe that the suggested scheme of training would fully maintain, and possibly enhance, the standards now required by that body for the registration of nurses. I make the suggestions in the belief that their acceptance would enable these standards to be reached more easily, and more reasonably, than does the present system of training.

Broadgreen Hospital, Liverpool. L. FINDLAY.

INTRA-ARTICULAR TREATMENT

SIR,—I write to inform you of a further development of the intra-articular treatment of rheumatic joints, which was first described by Grant Waugh [1] and carried further [2] when acid potassium phosphate was substituted for lactic acid. Recently Dr. Harry Coke suggested that acid magnesium phosphate might be an improvement on acid potassium phosphate and in some cases it has been found to be so. Acid magnesium phosphate is more provocative of reaction, so half the usual amounts of the 1% solution * should be injected (for hips and knees 10 c.cm., for shoulders 5 c.cm., for elbows 3–5 c.cm., for wrists and ankles 3–4 c.cm.). For the smaller joints of fingers and toes acid magnesium phosphate should not be used. The main advantage is found to be in the treatment of the knees and hips when injections need to be repeated only once in 4–6 weeks instead of once a fortnight. Where there is either active synovitis or gross thickening of the tissues and enlargement of the joint, then the reaction is greater. Such joints are now first injected with the potassium salt, with the idea of opening up the joint cavity and stretching the capsule, and then, if no reaction follows, a fortnight later with the magnesium.

In knee-joints, complicated by the accumulation of fluid, especially if, as so often happens, the suprapatellar and semimembranosus bursæ are also involved, the fluid from the bursa is aspirated and replaced by 5 c.cm. of acid magnesium phosphate without removing the needle, and in addition 10 c.cm. is injected into the joint.

London, W.1. H. WARREN CROWE.

1. Waugh, W. G. *Lancet*, 1938, i, 487.
2. Crowe, H. W. *Ibid*, 1944, i, 562.

NEW REMEDY FOR LUPUS

SIR,—I doubt whether there is a known answer to Dr. E. Harvey's question (April 6), which I take to mean broadly, How do we suppose that calciferol acts? There is, however, some evidence that its beneficial effect on lupus may not be the direct result of the disturbance of calcium metabolism, to which in large dosage it gives rise. Some of the cases treated at St. Thomas's Hospital cleared up quite rapidly without developing a raised serum calcium; on the other hand a few of those who gave high readings have been relatively unresponsive to the treatment.

The publications in France by M. J. Charpy [1] since 1943, of which Dr. Prosser Thomas and I became aware for the first time last December, seem to show that his results were better than those that we had been able to achieve. Charpy, whose method consisted of giving calciferol in glycerin and alcohol ('Sterogyl' Roussel) by mouth, together with calcium gluconate or supplementary milk, reported 27 cases of whom all were cured, some with the aid of an occasional electrocoagulation. Of 40 cases treated by us from August, 1943, to December, 1945, 32 were considered suitable for assessment; of these over half appeared to be cured, 9 were much better but not cured, and 5 were only moderately responsive.[2] Accordingly calcium gluconate and milk were added to the treatment of the more or less refractory cases. This however did not appear to accelerate improvement, and after two months it was stopped.

Our results have actually been very similar to a series published by Gougerot and Gaullier,[3] who out of 35 cases treated by the Charpy method reported that 20 appeared to be cured, 5 were much improved, 6 not greatly improved, and 4 unchanged.

Furthermore, Vachon and Feroldi,[4] in a histological study of 7 cases treated by the Charpy method, found residual lupomas but no deposits of calcium, and concluded that the improvement of the lupus in no way depended upon calcification.

As it seems likely that this treatment will be applied extensively in this country to the treatment of lupus and other forms of tuberculosis, and a great many patients may thus be subjected to the risk of hypervitaminosis D, it may be as well to repeat the warning note contained in your annotation of Jan. 5.

The subject of toxic effects of calciferol in heavy dosage is fully reviewed by Smith Freeman and others.[5] They describe three cases of renal damage, in two of which

* A 1% solution of acid magnesium phosphate in isotonic saline, with 0·5% phenol as a preservative, is now put up like acid potassium phosphate in 100 c.cm. bottles ready for use, by Messrs. Allen & Hanburys.

1. Charpy, M. J. *Ann. Derm. Syph. Paris*, 1943, p. 331; 1944, p. 110.
2. Dowling, G. B., Prosser Thomas, E. W. *Proc. R. Soc. Med.* 1945, 39, 96; Dowling, G. B., Prosser Thomas, E. W., Wallace, H. J. *Ibid*, 1946, 39, 225.
3. Gougerot, H., Gaullier. *Ann. Derm. Syph. Paris*, 1944, p. 210.
4. Vachon, R., Feroldi, J. *Ibid*. 1945, p. 241.
5. Freeman, S., Rhoads, P. S., Yeager, L. B. *J. Amer. med. Ass.* 1946, 130, 197.

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calcium was deposited in joints, and they quote others (a case of calcification of finger joints has been reported in France in lupus treated by the Charpy method). The authors consider it imperative that the ingestion of calcium should not be increased above that in the normal diet during treatment with large doses of vitamin D, that estimations of serum calcium should be carried out regularly as a safeguard against metastatic calcification and renal damage, and that tests for renal function should be applied from time to time.

I would add that the doses quoted in this and other papers dealing with toxic effects of calciferol have usually been considerably larger than those that appear to be adequate in the treatment of lupus. Nevertheless hypercalcæmia has occurred with some frequency in our cases. In such cases the serum calcium has remained high for about two months, returning to normal at the end of about three months. Fortunately, though the lupus has gained ground during this interval, it has never relapsed completely, and one case has been cured by four short bursts of rather intensive treatment—150,000 I.U. daily for two months—separated by long intervals. The remedies employed by Prosser Thomas and myself have been 'Ostelin High Potency' tablets each containing 50,000 I.U., or the following mixture:

Vitamin D (Glaxo) 1 million units per g.	160 grammes
Acacia pulv.	1½ oz.
Mucilage tragacanth, or equivalent	4 fl. oz.
Propyl gallate (or hydroquinone)	20 grains
'Nipagin' (or chloroform to preserve)	20 grains
Water	to 40 fl. oz.

This is diluted 10 times for dispensing—i.e., it is supplied to the patient at 50,000 I.U. per drachm.

The tablets and mixture have appeared to be about equally satisfactory.

It would be unfortunate if the use of a remedy which promises to be of great value should be marred by avoidable accidents.

London, W.1. G. B. DOWLING.

MEDICAL AID FOR AUSTRIA

SIR,—The Association of Austrian Doctors in Great Britain, conscious of its duties and responsibilities towards the victims of Nazi terror in Austria, launches an urgent appeal to all colleagues and people of good will in this country to save thousands of victims of Nazism from threatening death. Information reaching us from authoritative sources makes it clear that there is an acute shortage not only of food but also of essential drugs. Sulphonamides, penicillin, arsenicals, analgesics, digitalis, insulin, and vitamins are among those urgently required.

With the help of our British colleagues we hope to save the lives of many children and old folk; and any donation in the form of money or drugs will be gratefully received. Arrangements have been made to obtain an export permit for drugs to Austria.

We are confident that everybody who values young children's lives will respond to our appeal, which has the support of Sir Henry Dale, O.M., F.R.C.P., Sir Alfred Webb-Johnson, P.R.C.S., Sir Philip Manson-Bahr, F.R.C.P., and Mr. W. McAdam Eccles, F.R.C.S. Donations (marked "Medical Aid") should be sent to the hon. treasurer, Aid to Austria Appeal Committee, room 156, 21, Bloomsbury Street, London, W.C.1.

M. SCHACHERL (chairman) A. HAMMERMANN (hon. secretary)
Association of Austrian Doctors in Great Britain.

London, W.C.2.

GLANDULAR FEVER WITH GLYCOSURIA AND LATENT JAUNDICE

SIR,—Though many cases of glandular fever with hepatitis have been described, it may be of interest to record one which also showed glycosuria.

An able seaman, aged 21, reported sick with arthralgia of knees, hips, back, and neck, with malaise. This continued for a week without much change. Throughout this time he remained febrile, with no physical signs. On the eighth day he complained of a sore throat and a lump in the neck. This gradually became worse, causing dysphagia. The left tonsil was swollen and inflamed, but not ulcerated, and the corresponding gland was enlarged and tender. Three days later he had nausea and mid-line epigastric pain and tenderness, and vomited that evening.

On the twelfth day of the illness the glands of the left axilla were enlarged, and the spleen was tender and palpable a finger-breadth below the left costal margin. The liver edge was also tender but ill-defined, and the urine contained bile-salts and pigments. There was no sign of jaundice, but the conjunctivæ were suffused and might have masked this. The stools remained highly coloured. The blood picture showed a total white count of 8437 polymorphs and a relative lymphocytosis of 98%, with many large hyaline cells.

Next day he had a free epistaxis, and later both sugar and bile were found in the urine. For the next two days the urine produced a heavy reduction of Benedict's solution. The Paul-Bunnell agglutination test was positive at 1/1000, and a further blood-count showed a slight reduction of the lymphocytosis (polymorphs 12%, small lymphocytes 59%, large lymphocytes 19%, large hyaline 10%). He was admitted to hospital, his urine still containing much bile, and sugar in a diminished quantity. There was still no trace of jaundice. The Kahn reaction was not done. He made a satisfactory recovery.

In view of the symptoms, signs, characteristic blood picture, and high titre of the agglutination reaction, glandular fever was diagnosed. The temporary glycosuria suggests that the pancreas was involved. The underlying pathology of this can only be surmised. Presumably there is a toxic pancreatitis similar to the toxic process in the liver. Such a condition may explain the occasional appearance of glycosuria as a complication in mumps. Bernstein [1] cites three cases of glandular fever with glycosuria described by Scheer.[2]

Caterham, Surrey. A. D. J. WATT.

MILESTONE IN ANÆSTHESIA

SIR,—In their letter of April 6, Dr. Laurent and Dr. Romanis eastigate anæsthetists who do not inject 'Prostigmin' when curare has led to respiratory arrest. May I respectfully suggest that some physicians have not yet quite realised the fundamental changes in the criteria of anæsthetic overdosage which were brought about by the advent of controlled respiration?

All narcotic and relaxant drugs in sufficiently large doses cause respiratory depression and eventual arrest, and it was at one time customary to describe the condition as "overdosage." It is now realised, however, that provided there are no untoward effects on the cardiovascular and other systems, such as blood-pressure fall or pulse-rate rise, and provided also that the drug is excreted rapidly, there is no reason why the narcosis should not be maintained at this deep plane using controlled respiration, if the nature of the operation renders it advantageous. This applies whether the respiratory paralysis is central as with cyclopropane or peripheral as with curare. This technique is not justified with such drugs as chloroform and the barbiturates which in deep narcosis cause profound circulatory depression even if adequate ventilation is maintained.

It is true that prostigmin, being an anticholinesterase, and thus prolonging the action of acetylcholine at the myoneural junction, will theoretically antagonise curare, although the effect does not seem to be very striking in man, but the use of this drug is seldom indicated in anæsthetic practice unless the operation has been completed. Otherwise, rigidity will return and a further dose of curare or a deepening of the general anæsthesia will become necessary.

In confirmation of this view, cases of inadvertent curare overdosage of fantastic dimensions have been reported from America with complete recovery using no treatment whatever except artificial respiration.

St. Albans. C. LANGTON HEWER.

SIR,—The published reports on the use of tubocurarine chloride and of another preparation of curare alkaloids in anæsthesia leave no doubt in one's mind that this is a most valuable advance but that considerable danger is involved.

I have not seen any reference in these reports to the possible use of quinine as an adjuvant to the curare preparations although it possesses well-known pharmacological effects which might render it valuable for this purpose. Goodman and Gilman, in their "*Pharmacological Basis of Therapeutics*" (p. 908), say: "Quinine

1. Bernstein, A. *Medicine, Baltimore*, 1940, 19, 85.
2. Scheer, K. *Mschr. Kinderheilk.* 1930, 48, 59.

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also possesses a direct curare-like action on skeletal muscle. When the alkaloid is administered to a partially curarised muscle, the curarisation is completed." The concomitant use of quinine might reduce the dose of curare alkaloid needed, thereby increasing the safety of the procedure and, at the same time, effecting an economy in scarce preparations.

I believe that the use of quinine for other than the treatment of malaria is prohibited under a war-time order, but that a special dispensation was granted for its use in the induction of labour and in the treatment of myotonia congenita. Perhaps this could be stretched to cover its use in assisting the relaxation of skeletal muscles in anæsthesia.

Dagenham, Essex. D. G. ARDLEY. Pharmaceutical Specialities (May and Baker) Ltd.

BRITISH PROTEIN HYDROLYSATES

SIR,—In their paper of April 6 (p. 492), Dr. ap Simon and Dr. Donald Brown quote a personal communication from Dr. H. E. Magee stating that "thrombophlebitis almost always follows the use of any of the protein hydrolysates so far made in this country." A number of preparations of such hydrolysates made by several firms in this country by the use of enzymes have been tested under the auspices of the Protein Requirements Committee of the Medical Research Council. The tests were usually done by drip infusion over several hours, and phlebitis was not as frequent as it might appear from the quoted statement; moreover the occurrence of phlebitis is not confined to British preparations.

May I also take this opportunity to correct a mistaken impression that British hydrolysates are prepared by treatment with acid? In fact all British preparations except one are prepared by enzymic digestion and are carefully tested on animals before being released for clinical trial. It must, however, be strongly emphasised that the method of intravenous alimentation by protein hydrolysates is still under investigation both as far as production and clinical indications and administration are concerned.

National Institute for Medical Research. A. NEUBERGER, Secretary, Protein Requirements Committee, Medical Research Council.

THE TUBERCULIN-TESTED CHILD

SIR,—One of the results of the increasing volume of child-welfare facilities is that routine tuberculin-testing, either by the Mantoux or the Vollmer method, is becoming more and more a part of clinic work. People who, like myself, have a very short clinical experience to draw upon, have to explain to parents the significance of the tests and to give a prognosis where they are positive.

It is important that both the information and the prognosis which we give should be accurate, and I feel I need a far clearer picture of the prognostic significance of tuberculin-sensitivity in children under five than the literature seems to provide. The proportion of positive reactors in a group of children seen by me of ages ranging from two to five years is between 20 and 25%. Is it justifiable to say to parents: "This test indicates that your child has met the tubercle bacillus; it does not necessarily mean that he will have a clinical illness or require active treatment." Or should we give the graver prognosis which Moncrieff's recent paper[1] implies? The estimate of the incidence of overt clinical tuberculosis in positive reactors under five has been put as high as 86%, but these estimates are not based upon follow-up into adult life. Like those of Armand-Delille, they seem to refer to cases where contact is not broken as soon as a positive test appears. Bearing in mind that the Vollmer test is being used, and has been shown by Deane[2] to be a wide net through which many positive reactors slip, almost all the initial, benign, or generally benign, primary foci, which appear in adult skiagrams and postmortems, fall in this category.

Clearly there can be no two ways about the preliminary investigation of these reactors—all are referred as a routine for radiography and supervision by the tuberculosis officer, with full investigation of contacts. Yet though adult sources of infection are often uncovered in this process, expert radiography and clinical examination seem very rarely to detect lung changes, cervical adenitis, or any other tangible foci. At present, beyond regular supervision, weighing, and X-raying it is hard to know what prophylactic measures to take. Are all these cases to be regarded as candidates for future special-school treatment? The one proven precaution, segregation from repeated reinfection, has become more rather than less difficult, owing to shortage of every kind of accommodation. The new health scheme provides no means of segregating unwilling adult sources of bacilli, and every positive child reactor indicates the probable existence of one such source, in an area where efficient pasteurisation is widespread.

In view of these problems, which must confront junior child-welfare officers generally, an authoritative statement on prognosis, treatment, and parental education in relation to the routine tuberculin tests would be very valuable.

London, S.E.23. ALEX COMFORT.

1. Moncrieff, A. A. *Lancet*, 1945, ii, 621.
2. Deane, E. H. W. *Ibid*, Feb. 2, 1946, p. 162.

Public Health

A Better Tuberculosis Service

THE Joint Tuberculosis Council's report on development of the tuberculosis services[1] has now been circulated. It puts the population to be served by a working unit at a minimum of 250,000, but says that a comprehensive tuberculosis service for a region requires a much larger number, probably not less than a million. The service must be part of the hospital plan, and not an "attached" service; tuberculosis physicians must be able to take their place alongside consultants in other branches of medicine. For these reasons it is proposed that tuberculosis work should be organised on a regional basis under joint tuberculosis boards with appropriate powers. Presumably these might be associated with, or form subcommittees of, the regional hospital boards foreshadowed in the National Health Service Bill. In order that dispensary and domiciliary work should not be divorced from the institutional work of the area, the report suggests that the senior tuberculosis officer of each region should have access to the joint board, and the board should have power to recommend measures for development of the service. Tuberculosis clinicians should be appointed in the same way as other consultants in the National Health Service, and paid on the same basis as specialists in other branches of medicine, whether working whole-time or part-time.

Infectious Disease in England and Wales

WEEK ENDED APRIL 6

Notifications.—Infectious disease: smallpox 7 (2 at Bebington, 3 at Southend-on-Sea, 2 at Liverpool); scarlet fever, 1392; whooping-cough, 2109; diphtheria, 463; paratyphoid, 3; typhoid, 3; measles (excluding rubella), 2268; pneumonia (primary or influenzal), 967; cerebrospinal fever, 96; poliomyelitis, 4; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 294; puerperal pyrexia, 176; ophthalmia neonatorum, 49. No case of cholera or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 2 (0) from measles, 7 (3) from whooping-cough, 7 (0) from diphtheria, 65 (17) from diarrhœa and enteritis under two years, and 47 (4) from influenza.

The number of stillbirths notified during the week was 266 (corresponding to a rate of 32 per thousand total births), including 38 in London.

1. Copies from the hon. secretary of the Council, 1, Becket Street, Oxford. (See *Lancet*, Jan. 12, p. 72.)

Dr. Ali Tewfik Shousha Pasha, under-secretary to the Egyptian Ministry of Health, is paying a ten-day visit to this country to study the health services; and Dr. M. Grzybowski, professor of dermatology in the University of Warsaw, has arrived in England with a delegation of Polish scientists. The British Council has arranged both visits.

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Parliament

ON THE FLOOR OF THE HOUSE

WE are still discussing food—its supply, distribution, and production. We have offered to ration bread if the U.S.A. will do the same. And the U.S.A. has said that it is for them impracticable. In the House of Lords, Lord Rothschild, who is a scientist and a member of the Labour Party, spoke on the pasteurisation of milk, and the Government have announced that they are considering its extension.

But in Budget week the Chancellor of the Exchequer takes precedence. Mr. Dalton's first normal Budget has had a favourable reception, even on the Stock Exchange. The Chancellor quoted a newspaper headline "Industrial shares boom and gilts spurt" and said that was the language they talked in the City. Exemptions from income tax are considerable (2 million people), the allowance for earned income has increased, and there are reductions in purchase tax on articles of common use in the home. So that despite a scaling up of death duties on big estates—if you have £2 million to leave your successors will have to scrape along on a bare half million—nearly everyone seems pleased. P.A.Y.E. too is to be reconsidered, although Mr. Dalton said he did not think it was P.A.Y.E. that people most objected to but PAYING.

The Chancellor does not intend apparently to remove purchase tax altogether; he regards it, suitably reduced, as a proper source of revenue and in general favours indirect rather than direct taxation over a wide field. The first Budget in a year of peace shows reduced expenditure, expanding revenue, and expanding production. We have the basis of an assured life on which we can build a happier life.

The postponement of the second reading of the National Health Service Bill has caused disappointment on all sides of the House. But it was agreed by the Government subject to the proviso that the second reading, the Committee stage, and the remaining stages of the Bill were not thereby prejudiced. Mr. Churchill said that on this Bill "there are great differences of opinion, but there is also a much larger common ground of agreement on measures which were contemplated, and even advanced a considerable distance during the Coalition Government." And Mr. Churchill trusted "that this business will not suffer because of the postponement until after Easter." This exchange of question and answer between the leader of the House and the leader of the Opposition means that there will be good debating and ample discussion, but that no unbridgeable gap exists between the parties, and it is hoped that the National Health Service Bill will be law by this summer.

MEDICUS, M.P.

FROM THE PRESS GALLERY

Footing the Bill

In introducing his spring Budget on April 9, Mr. DALTON, Chancellor of the Exchequer, said that the true increase this year over last year in the Civil Departments of £145 million signified a swift advance along a broad front of social improvement. The main items included £4 million more for universities, museums, libraries, and art galleries. As recently announced, milk in schools would be free for all children from Aug. 1 next, and there would be an increase of £4 million for school milk and meals. During this next year £19 million more would go to housing, and £38 million to start family allowances next August. There would also be £14 million more for old-age pensioners and widows, who would begin to draw their increased pensions next autumn.

A stable cost-of-living index, he continued, was a sheet-anchor in the stormy waters of transition from war to peace, and he hoped to continue that policy during 1946. But price stability cost a lot of money. These subsidies had been running at the rate of £250 million, and in his Budget statement last October he had estimated that the ending of Lend Lease would add at least £50 million a year to the cost. In fact it had added more, and he now put the cost for 1946–47 at £335 million. It was already nearly three-quarters of the cost of the National Debt, and it might rise higher. The cost of imported food was steadily tending upwards for reasons outside the Government's control. The Government could not go on indefinitely with this policy regardless of cost, and it would have to be reconsidered next year, or even earlier, if the prices of necessary imports or home supplies rose steeply.

The central group of social services—education, housing, health services, national insurance and family allowances, and war pensions—would cost the Exchequer some £500 million in 1946–47. This total was likely to rise to some £700 million the following year, and after that to go on rising, though at a slower rate. More than half the increase of £200 million in these two years was in the health services, and especially in the new arrangements for hospitals under the bold and constructive National Health Service Bill. But from the point of view of the Treasury, a great part of this increased Exchequer contribution to the health services was a transfer from the rates to the taxes, and would have to be offset by a rearrangement in the relations between the central and local authorities. He proposed to exempt all workers' contributions to National Insurance from income tax. This would give the contributors a relief equivalent, when the contributions reached their maximum, to an additional allowance of £11 per year. The employers' contributions were already exempt as a trading expense, and the exemption would extend to self-employed persons, and to householders who employed domestic servants. This concession would cost the Revenue £40 million in a full year.

In describing the new rates of death duties, Mr. Dalton said that in future more use will be made of the power given under the Lloyd George Budget of 1909–10 to accept land in payment of death duties, and he also proposed to carry £50 million in the coming year, due to the sale of war stores, to a special fund to be called the National Land Fund. This money would be available to increase the national estate, and, he suggested, might well be used to help such bodies as the National Trust, the Youth Hostels Association, and the Ramblers' Associations, whose purpose is not to make profit but to open the country to the people.

Pasteurisation of Milk

In rising to make his maiden speech on this subject in the House of Lords on April 10 Lord ROTHSCHILD said he was fortified by the backing of such learned institutions as the British Medical Association, the Society of Medical Officers of Health, the Joint Tuberculosis Council, and the Royal Colleges of Physicians and Surgeons. As many people died each year from drinking milk contaminated with the bovine tuberculosis germ as if all the members of the Upper House were killed twice a year—a matter, he thought their Lordships would agree, of some gravity—while the number of casualties who required months of hospital treatment probably lay between 7000 and 8000. Undulant fever, typhoid and paratyphoid fever, dysentery, food-poisoning, scarlet fever, and diphtheria could also all be milk-borne, and there could be no argument that considerable benefit would accrue by removing a source of disease and death from the population's milk.

It was said that pasteurised milk tasted nasty, or at any rate different from raw milk; but experiments had shown that most people could not distinguish between raw and heat-treated milk. It was also said that pasteurisation took "the life" out of milk, yet according to the director of the National Institute for Research in Dairying the difference in composition between raw and heat-treated milk was less than between samples of raw milk taken from different herds. Another objection, that pasteurisation would remove the incentive to clean milk, showed a confusion of thought. Heat treatment might render milk safe but it could not render dirty milk clean. A criticism put forward

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with the success which only real nonsense seemed able to engender was that by removing the germs we should prevent the population from acquiring a natural immunity. To him it seemed that the cost of this immunity, even if it existed, was somewhat high. Why did we not drink water contaminated with the germs of enteric fever?

He did not ask the Government to make it illegal to sell unpasteurised milk anywhere in the United Kingdom, but he believed that the compulsory institution of heat treatment in towns with more than 20,000 inhabitants would not interfere with the small producer-retailer and might well increase our milk-supply. The Dairy Engineers' Association informed him that not one screw of the equipment necessary would have to be bought in the United States. The exigencies of war had been responsible for shelving Lord Woolton's scheme for compulsory pasteurisation; the exigencies of peace made its institution an urgent necessity.

Earl DE LA WARR confessed that his prejudices were against pasteurisation, but he thought that producers must supply what the consumer wants, and there was no doubt that the majority of the medical profession was in favour of pasteurisation, at any rate for our bulked urban supplies, and he pointed out that 70% of our milk was pasteurised already. He agreed with Lord Rothschild that compulsion should be applied to towns of over 20,000 but he would except milk that was of an accredited standard of cleanliness.

Lord AMMON declared that the Government were fully aware of their responsibility for the country's milk, increased by the milk-in-schools' scheme, and Defence Regulation 55G had prohibited the retail supply of milk in specified areas unless they conformed to a certain standard. Unfortunately it had not yet been possible to specify any areas. But progress had been made; since 1944 the Ministry of Food had paid an allowance of ½d. a gallon to all heat-treated milk, and since April 1, 1946, that allowance had been increased to 1½d. In England and Wales the annual liquid consumption of milk amounted to about 1075 million gallons, of which 725 million gallons was heat-treated. But the Government agreed with Lord Rothschild that the extension of heat treatment was essential.

Lord ADDISON was anxious that the increased consumption of milk should not be prejudiced by the controversy, and he stressed that the improvement of farm buildings was an essential concomitant to the improvement of herds.

QUESTION TIME

Voluntary Hospitals Finance

Mr. J. BINNS asked the Minister of Health what percentage of the expenditure of voluntary hospitals was provided from private sources or from public funds.—Mr. C. W. KEY replied: The latest published figures available for England and Wales show that in 1941, 36% of the hospitals' income was derived from voluntary sources of which more than half came from income on investments and legacies; 24% was derived from public funds; and the remaining 40% from payments by patients, including payments through contributory schemes.

Benefit Rights of Chronic Invalids

Mr. W. GALLACHER asked the Minister of National Insurance what benefit would accrue to persons who, by reason of permanent ill-health, had never become insurable and who were unfit to follow any trade or occupation, and had not reached retiring age or age qualifying for a non-contributory pension.—Mr. G. S. LINDGREN replied: Under the National Insurance scheme such persons not being gainfully occupied will come within the insurance scheme as non-employed persons. Subject to payment of the appropriate contributions for the requisite qualifying period they will in due course become qualified for benefits in the non-employed class.

Unrra Supplies to Austria

Mr. PETER FREEMAN asked the Secretary of State for Foreign Affairs what was the amount now allocated to Austria by UNRRA and the supplies sent to that country up to March 31, 1946.—Mr. H. MCNEIL replied: UNRRA have just signed an agreement with the Austrian government under which they take over responsibility for supplies in Austria as from April 1. This agreement relates to the whole of Austria treated as a unit and not to any particular zones. The programme of supplies agreed by UNRRA for Austria up to June 30 this year amounts to $59 million. The programme for the rest of the year has not yet been determined. The military authorities have agreed to hand over to UNRRA the supplies which they had already procured for the civilian population, and it is these supplies which will be distributed under UNRRA supervision during April. UNRRA's own shipments have not yet begun on a full scale, but supplementary supplies were imported by UNRRA before March 31. These included some 8000 tons of wheat, 6000 tons of potatoes, and 200 tons of vehicles and other supplies.

Scrub-typhus Vaccine

Replying to a question, Mr. J. LAWSON, the Secretary of State for War, stated the first batch of scrub-typhus vaccine was despatched to India for use in ALFSEA, in June, 1945, and by December 268,000 c.cm. had been despatched. Information was not available in the War Office as to the number of men inoculated, but the number of cases of scrub-typhus reported for the second half of 1944 and 1945 was as follows:

	1944	1945		1944	1945
July	133	210	October ..	728	177
August	835	157	November ..	677	120
September ..	694	111	December ..	530	65

Malaria Control in Malaya

Mr. D. L. LIPSON asked the Secretary of State for the Colonies if his attention had been drawn to the report by the Ross Institute that conditions in Malaya, with regard to malarial control, had reverted to those of 25 years ago; and what action was being taken or contemplated by the Government of Malaya to remedy this.—Mr. GEORGE HALL replied: I have seen this report. The Military Administration fully appreciate the serious effects of Japanese neglect and within the limitations of man-power, supplies, and transport they pushed on with the restoration of malaria control in the larger centres of population. The Advisory Malaria Board has been reconstituted and it is the intention of the civil medical authorities, who have now taken over, to press forward not only with emergency measures of oiling and the distribution of drugs, but also with the reconstruction of the antimalarial works which did so much to reduce the incidence of malaria in pre-war Malaya.

Infantile Paralysis at Singapore

Mr. A. EDWARD DAVIES asked the Secretary of State for War if he was aware of an outbreak of anterior poliomyelitis, infantile paralysis, among the men of the 6th Infantry Brigade headquarters, signals section, British SEAC; how many men are affected; what was the cause of the outbreak; and what action was being taken in respect of same.—Mr. F. J. BELLENGER replied: I am aware of an outbreak of infantile paralysis in Singapore. Up to March 26, 1946, 17 Army cases with 6 deaths had been notified, but I cannot say how many cases occurred in the particular unit mentioned. In the other Services 33 cases with 6 deaths occurred. The outbreak was first reported on Feb. 20. A research epidemiologist nominated by the Medical Research Council left by air on March 2 to investigate the outbreak and, in preliminary reports on March 13 and 19, gave his opinion that the outbreak had passed its peak and that all possible measures were being taken to prevent a recrudescence. The outbreak has been attributed to the presence of carriers of the virus in surroundings where, owing to Japanese neglect, unsanitary conditions favoured the spread of the disease. The incidence was mainly among young Chinese children. Cases occurring among Service personnel are believed to have originated from contact with carriers or cases among the civilian population.

Two hundred delicate English children are to spend six months at a children's home in Adelboden as the guests of the Swiss government under the care of the Don Suisse and the Secours Suisse aux Enfants. At the request of the Ministry of Education the London County Council have selected these young visitors from their schools for delicate children. The children were nominated in the first instance by the head teachers, and places were allocated to each school in proportion to the number of children on its roll. Each child will be medically examined before leaving, and children with tuberculosis or other infectious diseases will be excluded. The party, which leaves London on April 24, will be in the charge of six nursing sisters and it is possible that some of the children's teachers will also accompany them.

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Notes and News

THE PROMOTION OF PHILOSOPHY

ON the coming-of-age of the British Institute of Philosophy, the following letter comes from Viscount Samuel, Sir David Ross, and Lord Lindsay of Birker:

"For twenty-one years the institute has been active in promoting the purposes for which it was founded—to serve as a link between philosophers and the everyday world, and to spread such general understanding as can be reached of the universe in which we live and of man's place in it. There have been continuous courses of lectures for students on the various branches of philosophy and popular addresses on fundamental issues, drawing large audiences and evoking discussion. Local branches have been formed in several cities. *Philosophy*, the quarterly journal of the institute, contains articles by writers of distinction on the great philosophical questions, as well as reviews by specialists of the important new books on such subjects, published in this or other countries."

"Throughout the war years the work of the institute was continued to the extent that the difficult conditions allowed, although it suffered the same shrinkage of membership as other such societies. The numbers still exceed a thousand; but that is far too few to enable the institute to fulfil adequately the objects it exists to promote. The annual subscription is only one guinea, which includes receipt of the journal, and there is no entrance fee. The income so derived is plainly insufficient; but the council are reluctant to raise the terms of membership for fear of causing a further contraction. The right remedy is the opposite—a large increase in the number of members. It is in order to appeal to those interested to join the institute that this letter is written.

"There must be great numbers of men and women, in all walks of life, who recognise that our age is a time of intellectual and moral confusion, and that this is the root cause of its troubles and disasters. Some may take refuge in a passive and futile pessimism; others may be tempted to plunge into some desperate kind of revolutionary action, more likely to make things still worse. To build up a body of positive, instead of merely critical, thought, as a basis for well-considered constructive action in the spheres of morals, of politics, and of economics, is the only right course. In this a leading part should be played by British philosophy, which has won much distinction in the past, and may render still greater service in the future, in formulating thought and linking it with action. But an organisation is needed to furnish a platform for discussion and to disseminate ideas. The British Institute of Philosophy is such an organisation. What is now necessary is a reinforcement of its numbers as a means to reinvigorating its action."

Information and forms of membership may be had from the director of studies, British Institute of Philosophy, University Hall, 14, Gordon Square, London, W.C.1.

A VISIT TO CANADA ?

THE Canadian Medical Association will hold its 77th annual meeting in early June at Banff, Alberta, under the auspices of the British Columbia and Alberta divisions of the association. Our Canadian Correspondent writes that "visitors from Britain would be warmly welcomed in one of the most beautiful holiday resorts in the world."

PHARMACISTS AND THE HEALTH SERVICE

SPEAKING on April 9 as chairman of the joint committee on a National Pharmaceutical Service, Mr. W. J. Tristram said that the attitude of pharmacists to the National Health Service is one of qualified approval. As chemists, he said, they would not oppose the Bill on any major issue. It had provided certain things which pharmacists had been pressing for, one of which was that pharmaceutical work should be done by or under the directed supervision of pharmacists who had given 30 years' service to the State under the National Health Insurance Act. "We know that these services at present given in chemists' shops could be developed to meet all the pharmaceutical needs of the new service. We are going to tell the Minister of Health that we can do it without any institutional service of this kind. It is a development we do not welcome."

The separation of prescribing from dispensing, provided for in the Bill was, he said, very much in the public interest. Successive secretaries of the British Medical Association had expressed their approval of the principle of separating prescribing from dispensing as it was separated today in Latin countries. Except in special circumstances dispensing in doctors' surgeries would now come to an end. Chemists also felt that, while committees were important at all levels, the advice of a pharmacist should be available at most of the levels. Another point of dissatisfaction was that the local executive councils under the Bill were to have only two pharmaceutical representatives. Three was a reasonable minimum if employees as well as employers and public servants were to be represented.

It is estimated that 120 million prescriptions a year will be handled through the public service.

LONDON COUNTY COUNCIL

Two recommendations by the hospitals and medical services committee placed before this week's meeting of the council increase the links between the L.C.C. and the voluntary teaching institutions. Lambeth Hospital and the White Oak Hospital, Swanley, are to have resident medical officers nominated by the authorities of the Royal Eye Hospital. Students from the West London Hospital are to attend Fulham Hospital for instruction by Dr. Maurice Shaw, dean of the West London Hospital, who will assume clinical responsibility for 32 beds on the medical side.

In response to the Ministry of Health's appeal for assistance in the postgraduate education of released medical officers, 30 junior registrars are to be appointed to the mental hospitals, at a salary of £350–£550 a year. It has been decided that the initial salary of the 8 supernumerary senior registrars whose appointment to the Maudsley Hospital was approved last October (*Lancet*, Nov. 24, p. 692) may exceptionally be fixed at £350 for the first six months; this is to allow junior men who show promise and have not yet attained senior registrar's status to have a chance of obtaining the appointments.

Basic salaries for pathologists in the mental hospitals, which were set last December at £1000–£1300, are to be increased to £1250–£1500; and those of assistant pathologists are to be raised from £650–£800 to £750–£950.

The Nuffield Foundation has made a grant of £600 a year to Dr. Trevor H. Howell for research into chronic pathological changes in the aged; the council is to grant Dr. Howell an honorarium of £200 a year.

Mr. A. Reginald Stamp has been elected chairman of the hospitals and medical services committee.

Mr. J. H. Carver is to give up the medical superintendentship of St. Mary Abbots Hospital, Kensington, in order to work as a specialist in the L.C.C. service, to which he is already consulting urologist. Dr. J. E. S. Lloyd has been promoted to be medical superintendent of Tooting Bec Hospital, at a basic salary of £1450 a year.

Among the resignations is that of Dr. Robert Cruickshank on appointment as director of the Central Public-Health Laboratory at Colindale. Mr. E. Stanley Evans, medical superintendent of Queen Mary's Hospital for Children, Carshalton, has resigned to take up the appointment of medical superintendent at the Lord Mayor Treloar Cripples' Hospital and College, Alton. Dr. Alan Randle, medical superintendent of St. Giles' Hospital, is to retire owing to ill-health.

HOURS OF WORK

THAT fatigue reduces output has at last become an accepted fact in industry; and in the recent war much thought was given to planning hours so that the best and most economical use was made of the energy of workers. The Australian Department of Labour has published a bulletin on hours of work,[1] designed for the study of industrialists. It sets out the lengths of working weeks most appropriate for different kinds of work, and gives examples of shift rosters for weeks of various lengths, including days off, meal breaks, rest pauses, and night shifts. Where it is convenient for workers on different types of work to work the same hours, the 48-hour week has proved to be the most productive uniform regular level; but where they can be varied hours may range from 40, for concentrated clerical or inspection work, to 52 for work requiring constant attention but little concentration or muscular exertion.

1. Planning Hours of Work. Bulletin no. 4. Industrial Welfare Division, Department of Labour and National Service, Commonwealth of Australia. 1945. Pp. 28.

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Royal College of Surgeons of England

At a meeting of the council on April 11, Mr. Terence Millin was awarded a prize of £1000, presented by Mr. Charles Leopold Mayer of New York, in recognition of Mr. Millin's contributions to the surgical treatment of the prostate.

National University of Ireland

At a meeting of the senate on April 11, Dr. V. O'Hea-Cussen was appointed professor of ophthalmology at University College, Cork.

Association of Surgeons of Great Britain and Ireland

The annual meeting of the association will be held in London on May 7 and 8. The agenda for the first day includes a discussion on Inguinal Hernia, and short papers. On the second day there will be a discussion on Chronic Osteomyelitis, the Sequel to a Gunshot Wound; and operating sessions will be held at the principal hospitals.

Sheffield Blood-transfusion Depot

The address of the Sheffield depot of the regional blood-transfusion service is now Northfield Road, Crookes, Sheffield, 10 (Sheffield 63271). This depot serves South Yorkshire, Derbyshire, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire, and Rutland.

Naval Medical Compassionate Fund

A meeting of subscribers will be held at 3 P.M. on April 26 at the Medical Department of the Navy, 64, St. James's Street, London, S.W.1, for the purpose of electing six directors.

Royal Appointments

Surgeon Rear-Admiral F. J. D. Twigg and Surgeon Rear-Admiral H. R. B. Hull have been appointed honorary surgeons to the King in place of Surgeon Rear-Admiral C. V. Griffiths and Surgeon Rear-Admiral W. H. Edgar, and Surgeon Vice-Admiral H. St. C. Colson an honorary physician in place of Surgeon Vice-Admiral Sir Sheldon Dudley.

Travelling Fellowships in Medicine

The Medical Research Council invites applications for Rockefeller medical fellowships in the year 1946–47; these are intended for graduates in this country who are likely to benefit by a period of work in the United States or elsewhere abroad, before taking up positions for higher teaching or research in the United Kingdom. The stipend will ordinarily be £450 per annum, or £650 if the fellow is married; travelling expenses and some other allowances are paid. Applications are also invited for Dorothy Temple Cross research fellowships in tuberculosis, which will normally be awarded to candidates who wish to engage in study or research abroad. The stipend will ordinarily be £450 per annum for a single fellow and £650 for a married fellow. Further particulars may be obtained from the secretary of the council, 38, Old Queen Street, Westminster, London, S.W.1.

Appointments

BIGGS, ROSEMARY, M.B. Lond.: pathologist, South London Hospital for Women.

BUCK, G. H., B.M. Oxfd, D.O.M.S.: ophthalmic surgeon, East Suffolk and Ipswich Hospital.

COYTE, R., O.B.E., M.B. Lond., F.R.C.S.: second consulting surgeon, Enfield War Memorial Hospital.

NIGHTINGALE, G. S., M.R.C.S., D.P.M.: medical superintendent, Essex and Colchester Mental Hospital, Brentwood.

SHAW, T. H., M.B. Belf.: director of pathology, East Suffolk and Ipswich Hospital.

Bolingbroke Hospital, London.—The following appointments are announced:—

ANSON, B. J. E., M.R.C.S., D.A.: honorary anæsthetist.
ASHWORTH, H. K., M.B. Manc., D.A.: honorary anæsthetist.
DENTON, M. V. H., M.R.C.S., D.A.: honorary anæsthetist.
HANDLEY, R. S., O.B.E., B.CHIR. Camb., F.R.C.S.: honorary surgeon.
MANLEY, J. S. E., L.R.C.P.I.: honorary anæsthetist.
MURRAY, J. B., M.D. Camb., M.R.C.P.: honorary physician.
RODGERS, R. E., M.D. Camb., M.R.C.P.: honorary physician.

The following factory surgeons have been announced:—

EDINGTON, F. C., M.B. Edin.: Penrith, Cumberland.
EDINGTON, R. S., M.B. Glasg.: Errol, Perth.
GREGOR, W. McL., M.B. Glasg.: Lochwinnoch, Renfrew.
JOY, DAVID, M.R.C.S.: Frome, Somerset.
KEYS, R. F., M.B. Belf.: Costock, Nottingham.
LEITH, J. W., M.B. Edin.: Peterhead, Aberdeen.
LITTLEDALE, R. M., M.R.C.S.: Charing, Kent.
MUNRO, W. C., M.R.C.S.: Hunstanton, Norfolk.
NOWELL, A. J. P., M.B. Edin.: Wilmslow, Chester.

Medical Diary

APRIL 21 TO 27

Tuesday, 23rd

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE
5 P.M. (Royal Infirmary.) Prof. F. A. E. Crew, F.R.S.: Biology of Death.

Wednesday, 24th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. T. Holmes Sellors: Surgery of the Heart.

UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Prof. Lowenstein Ocular Tuberculosis.

Thursday, 25th

ROYAL COLLEGE OF SURGEONS
5 P.M. Sir Reginald Watson-Jones: Fractures of the Pelvic Girdle.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Urology.* Clinico-pathological meeting.

MEDICO-LEGAL SOCIETY
8.15 P.M. (26, Portland Place, W.1.) Mr. William Latey: Consummation of Marriage and the Law.

Friday, 26th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. T. Pomfret Kilner: Pedicle Grafting.

ROYAL SOCIETY OF MEDICINE
2.30 P.M. *Epidemiology and State Medicine.* (Wellcome Physiological Laboratories, Langley Court, Beckenham, Kent.) Demonstrations and film. Dr. H. J. Parish, Mr. A. T. Glenny: Preparation of Diphtheria Antitoxin and Prophylactics.
5 P.M. *Disease in Children.* (Cases will be shown at 4.15 P.M.)

WEST LONDON MEDICO-CHIRURGICAL SOCIETY
7.15 P.M. (South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7.) Dinner-discussion. Dr. John H. Hunt: Indian Fakirs.

Births, Marriages, and Deaths

BIRTHS

CRAIG.—On April 5, at Beaconsfield, the wife of Mr. J. Murison Craig, F.R.C.S.—a son.

FAIRBROTHER.—On April 11, at Wilmslow, the wife of Dr. R. W. Fairbrother—a daughter.

LITCHFIELD.—On April 9, at Ipswich, the wife of Lieut.-Colonel J. W. Litchfield, R.A.M.C.—a daughter.

MACGREGOR.—On April 9, at Sutton, the wife of Dr. Malcolm E. MacGregor—a daughter.

MILLS.—On April 6, at Bexhill-on-Sea, Sussex, the wife of Captain R. P. Mills, R.A.M.C.—a daughter.

PHILLIPS.—On April 11, the wife of Dr. E. H. D. Phillips, Worcester Park, Surrey—a daughter.

ROBINSON.—On April 7, the wife of Lieutenant P. K. Robinson, R.A.M.C.—a daughter.

ROGERS.—On April 9, at Blackhill, co. Durham, the wife of Dr. K. B. Rogers—a son.

SCOTT.—On April 1, the wife of Major J. B. Scott, R.A.M.C.—a son.

SIMPSON.—On April 8, in London, the wife of Dr. S. L. Simpson—a daughter.

VAIZEY.—On March 31, in Addis Ababa, the wife of Dr. Michae Vaizey—a daughter.

MARRIAGES

FAIRRIE—KAVANAGH.—On April 6, in London, Anthony Johnston Fairrie, surgeon lieutenant R.N.V.R., to Ann Kavanagh.

KELLOCK—RESTORICK.—On April 5, at Prittlewell, William de Montmorency Kellock, M.R.C.S., to Jean Restorick.

MASTERMAN—DAVIS.—On April 10, at Goring-by-Sea, Ernest Bertram Zeller Masterman, M.D., to Mary K. Davis.

MUIR—GIBBS.—On April 5, at Hobart, Tasmania, John B. G. Muir, M.S., F.R.C.S., to Joan Margaret Gibbs.

THOMAS—KETLEY.—On April 6, at Morden, Merley Thomas, M.R.C.S., to Muriel Joy Ketley.

DEATHS

CHALMERS WATSON.—On April 7, at Drem, Douglas Chalmers Watson, M.D. Edin., F.R.C.P.E.

FOSTER.—On April 10, at Hitchin, Arthur Herbert Foster, M.R.C.S., aged 70.

FRASER.—On April 7, at Castle-Douglas, Scotland, Duncan Hugh Fraser, M.B. Edin., F.R.C.S.

LATHAM.—On April 7, at Llandudno, Charles Hugh Latham, M.B. Lond., aged 67.

STOHR.—On April 7, at Rondebosch, Capetown, F. O. Stohr, D.M. Oxfd, aged 74.

THE Central Medical War Committee announces that Mr. GORDON UNGLEY, M.D., F.R.C.S., has resumed civilian practice at 94, Harley Street, W.1. (Welbeck 5471.)

THE Dunlop Rubber Company announces that it is now manufacturing limited quantities of 'Dunlopillo' products for medical purposes.

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MEDICO-SOCIOLOGICAL PROBLEMS OF AN AGEING POPULATION

F. A. E. CREW
M.D., D.Sc., Ph.D. Edin., F.R.C.P.E., F.R.S.
BRUCE AND JOHN USHER PROFESSOR OF PUBLIC HEALTH IN THE UNIVERSITY OF EDINBURGH

AFTER having been concerned for some six years with the medical affairs of the Army, a community consisting almost entirely of individuals ranging in age between 20 and 50, it was intriguing on return to civil life once more to find myself enmeshed in the interests of a complete population with an age range of 0–100. I began to hear the echoes of the plaintive cries of those who encountered, so they clamorously protested, nothing in the Army that could be of use to them in later years. After my Army experience I came to realise more clearly than ever before that the population of Scotland did indeed consist of three main age-groups—the young, the mature, and the old. In this strange world to which I had returned there seemed to be an embarrassing preponderance of the very young and the very old, among whom I had no place and to whose behaviours and peculiarities I found it difficult to adjust myself. Hence my awakened interest in their numbers, their needs, and their biological and social value.

I had returned to a Scotland that seemed to be flourishing in a biological sense. The birth-rate and the marriage-rate were up, infantile mortality was falling, the drift to the South had ceased, war losses had been relatively light, and the population had continued to increase in total size. But I knew that, to be quite sure that all was well, I must look below this attractive glittering surface and examine the age structure of our population.

AGE COMPOSITION OF A POPULATION

It is established that the age composition of a population is among the best yardsticks that can be used for the assessment of the biological healthiness of a people. It is a true record of the reactions of an organised group of living human beings, generation by generation, to those agencies, catastrophic and gentle, which affect the biological variables of natality, mortality, and migration. It shows how, for example, industrialisation, urbanisation, the spread of education, and changes in systems of land tenure, in the status of women, in standards of living, and in standards of value affect the birth-rate, death-rate, and migration-rate, and in so doing disturb the relative proportions of the young, the mature, and the old in the population concerned. It is the record of the social history of the people and furnishes a measure of the quality of social legislation. It therefore must attract the attention of all who are concerned with plans for the amelioration of man and of the social institutions that he has invented.

In the early days of human history it is to be assumed that the young, mature, and old congregated within and around the family. The family is a biological unit consisting of a mated pair together with their offspring. With the evolution of human society rules came to be devised by the larger group—the tribe, consisting of an aggregation of families—to govern and regulate the social interrelationships and to define the social responsibilities of parents and offspring. Parents became responsible to society for the education, protection, and food-supply of their own immature children. Furthermore, it can be assumed, the parents came to be held responsible also for the care and maintenance of their own aged relations. The mature were required to carry a load of dependency, the immature and the aged. In these early days the total load must have been heavy, and consisted almost entirely of the immature. Few individuals lived to reach middle age in the harsh and violent world that was theirs. The birth-rate was exceedingly high, so high as to overwhelm the effects of a very high infant mortality.

But in the history of all human societies this phase inevitably has passed into another, a phase of low dependency, brought about by a decrease in mortality generally followed by a decrease in fertility, with the result that the immature portion of the load is lightened and more mature adults remain alive to share the burden. Later still, with the decline in mortality and fertility persisting, increasing numbers of the mature pass into the aged group, and so the load becomes increased and consists largely of the old.

SOCIAL RESPONSIBILITY

A review of recent times reveals that society has come to accept the view that parental pairs should not be expected to shoulder this burden of dependency. Paternalistic governments have taken over many of the responsibilities previously imposed by society on parental pairs; for the immature free education, free medical care, family endowment, and subsidised meals are provided by the benevolent State; for the aged public support in the form of pensions is proffered. Manifestly it is assumed that the family, though adequate as a biological unit, has shown itself to be inadequate in the discharge of certain of its responsibilities, the mature being unable to carry the load of dependency furnished by their offspring together with their own senescent and self-insufficient relations. It does not follow that there has been a significant depreciation in the quality of the sense of social responsibility on the part of individuals comprising the productive age-groups; it is more likely that the burden that these are now required to carry has become greatly increased in an industrialised and urbanised society. Be this as it may, it is indeed impossible for parents themselves nowadays to undertake the complete education of their offspring, to provide proper food, and to safeguard them.

So it is that in our society there are to be found a central producing and reproducing group which by its efforts directly or indirectly supports two dependent groups, the immature and the unproductive retired. Manifestly the relative proportions of these groups within a population must affect almost every interest and activity within that population.

MODERN TRENDS

In the light of the foregoing it becomes a matter of importance to examine the present age composition of our population and to determine by comparison with its age structure in the past what trends are to be recognised. From the annual reports of the Registrar-General for Scotland it is a simple matter to construct the accompanying table. Presented in this fashion the figures disclose:

(1) the growth in total size of the Scottish population between 1861 and 1939, an increase of 63% in some 78 years;
(2) the proportion of males and females within these three main age-groups, there being more males than females among those under 15, and more females than males among those aged 15–64, and especially among those over 65;
(3) the changing proportions of the three groups, an 11·4% increase in the case of those under 15, an increase of 85·6% in the case of those aged 15–64, and an increase of 186·1% in respect of those aged 65 and over.

It is to be noted that the 1939 figures are not derived from a census; they are an intelligent guess, an estimate based upon national registration data. Though mobilisation for war, and internal migration associated with the movement of people away from dangerous places and with the dispersal of war factories, were in 1939 already making predictions of this kind hazardous, the estimate given is conservative and cannot possibly be grossly

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POPULATION TRENDS IN SCOTLAND

Census of	—	All ages	Under 15	15–64	65 +
1861	Males	1,449,848	561,446 (38·7%)	826,929 (57·1%)	61,473 (4·2%)
	Females	1,612,446	541,725 (33·6%)	982,967 (61·0%)	87,754 (5·4%)
	Both sexes	3,062,294	1,103,171 (35·7%)	1,809,896 (59·4%)	149,227 (4·9%)
1871	Males	1,603,143	625,326 (39·0%)	905,267 (56·5%)	72,550 (4·5%)
	Females	1,756,875	607,165 (34·6%)	1,048,257 (59·6%)	101,453 (5·8%)
	Both sexes	3,360,018	1,232,491 (36·7%)	1,953,524 (58·1%)	174,003 (5·2%)
1881	Males	1,799,475	691,956 (38·4%)	1,030,417 (57·3%)	77,102 (4·3%)
	Females	1,936,098	673,650 (34·8%)	1,153,583 (59·6%)	108,865 (5·6%)
	Both sexes	3,735,573	1,365,606 (36·6%)	2,184,000 (58·4%)	185,967 (5·0%)
1891	Males	1,942,717	725,745 (37·3%)	1,134,027 (58·4%)	82,945 (4·3%)
	Females	2,082,930	706,480 (33·9%)	1,256,299 (60·3%)	120,151 (5·8%)
	Both sexes	4,025,647	1,432,225 (35·6%)	2,390,326 (59·4%)	203,096 (5·0%)
1901	Males	2,173,755	755,962 (34·8%)	1,329,682 (61·2%)	88,111 (4·0%)
	Females	2,298,348	739,140 (32·2%)	1,430,862 (62·2%)	128,346 (5·6%)
	Both sexes	4,472,103	1,495,102 (33·4%)	2,760,544 (61·7%)	216,457 (4·9%)
1911	Males	2,308,839	772,821 (33·5%)	1,430,851 (62·0%)	105,167 (4·5%)
	Females	2,452,065	763,816 (31·2%)	1,535,992 (62·6%)	152,257 (6·2%)
	Both sexes	4,760,904	1,536,637 (32·3%)	2,966,843 (62·3%)	257,424 (5·4%)
1921	Males	2,347,642	725,375 (30·9%)	1,499,219 (63·9%)	123,048 (5·2%)
	Females	2,534,855	714,337 (28·2%)	1,651,658 (65·1%)	168,860 (6·7%)
	Both sexes	4,882,497	1,439,712 (29·6%)	3,150,877 (64·5%)	291,908 (6·0%)
1931	Males	2,325,523	657,546 (28·3%)	1,515,929 (65·2%)	151,958 (6·5%)
	Females	2,517,457	647,328 (25·7%)	1,668,773 (66·3%)	201,286 (8·0%)
	Both sexes	4,842,980	1,304,874 (26·9%)	3,184,702 (65·8%)	353,244 (7·3%)
Estimate 1939	Males	2,404,367	620,616 (25·8%)	1,596,937 (66·4%)	186,814 (7·8%)
	Females	2,611,252	608,649 (23·3%)	1,762,516 (67·5%)	240,087 (9·2%)
	Both sexes	5,015,619	1,229,265 (24·5%)	3,359,453 (67·0%)	426,901 (8·5%)

inaccurate. It agrees closely enough with the estimate of Notestein et al.[1] that in 1940 the Scottish population would probably be some 5,050,000, that by 1955 it would increase to 5,230,000, and that by 1970 it would decline to 5,090,000, a figure differing from that of 1940 by less than 1%.

There are relatively fewer children and relatively many more senescents in our population now than there were 80 years ago. The total load itself has become lightened during this time (the supported comprised 40·0% of the population in 1861 and only 33·0% in 1939), but its composition has become markedly altered (in 1861 those under 15 comprised 87·6% of the total load, and those 65 or over 12·4%; in 1931 the former constituted 74·2% and the latter 25·8%).

Thus it appears that our population is in that phase of population structure change in which the load of dependency is light. There is no cause for satisfaction in this; for, if fewer children enter the community through the portals of birth to become reinforcements for the 15–64 group, as individuals of this group grow old in their turn and pass into the over-65 group, the load of dependency will become progressively heavier.

1. Notestein, F. W., Taeuber, Irene B., Kirk, D. Future Population of Europe and the Soviet Union. Princeton University. 1944.

This relative increase in the over-65 group is the result of the fact that more people have been reaching the ages of 65 and over than was formerly the case. The death-rate per 1000 of the population, 20·750 in the quinquennium 1855–60, gradually and progressively fell to become 13·526 in 1936–40. Medical science has been successful in saving and prolonging the lives of individuals in the earlier age-groups so that these have passed into the later. The life expectancy in 1845 for males was 39·9, for females 41·9, and for any individual without reference to sex 40·9. In 1885 the expectancy had risen to 43·7, 47·2, and 45·4, whilst in 1935 it had become 59·7, 63·6, and 61·6. This improvement in the mortality of both males and females is less pronounced in the older age-groups than it is in the earlier; in fact, the mortality among the old is actually higher than it was twenty years ago. Then an old person was constitutionally tough; he had to be to reach old age. Latterly medicine has jockeyed the relatively fragile into senescence, and these are they, it would seem, who are responsible for the higher mortality among their age-group.

It will be noticed that the sex ratio differs with the different age-groups. Thus in 1939 females constituted 52·0% of the total population, 49·0% of those under 15; 52·4% of those aged 15–64; and 56·2% of the over-65 group. It is well established that the female of the species is more viable than the male, less prone to illness, suffering less severely, and possessing a greater expectation of life. It is to be expected therefore that any relative increase in the over-65 group will inevitably mean an increase in the proportion of females in the population as a whole, especially among those who can claim and exercise the franchise.

FUTURE DEVELOPMENTS

It is attractive, though hazardous, to attempt to project these trends into the future and to predict what will be the position in respect of age structure, say, after another generation. It is reasonable to hold the view that the birth-rate, quickened during the later years of the war as the direct result of the heightened marriage-rate, will slacken after a few years and thereafter will pick up the trend of gentle but progressive decline very close to the point where it would have been, had all vital trends remained unchanged and had there been no war. This is what happened last time and in all countries affected. The Scottish birth-rate was 34·104 per 1000 of the population in the quinquennium 1855–60. From that time it fell gradually and progressively to become 17·557 in 1936–40.

The middle group will absorb those now under 15 and will lose all those of its members who graduate into the over-65 class. How many these will be no-one can now tell. Much depends on developments in medicine and in other fields of human activity which are concerned with the promotion of health and the control of disease. But it is certain that the relative size of the over-65 group will continue to increase progressively, possibly by some 50,000 in ten years, and by some 75,000 in twenty years from now. Of these some two-thirds will be females. With this gentle ageing of the population the reproductive group will become correspondingly reduced, and so there will tend to be fewer births and more illness and more deaths.

But prediction of this kind is possible only when events are moving in orderly sequence, undisturbed by catastrophic happenings. We know that the number of our young men killed by enemy action has been relatively low, but we do not yet know how many babies were never conceived owing to the separation of mated pairs.

It is always the case that the latter type of casualty greatly outnumbers the former. Thus the effects of the war, whatever their magnitude, cannot do other than

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tend to amplify the trends that have been changing the age structure of our population. The processes of birth and non-violent death continue during wars and, though less dramatic, bring about changes in age structure greater than war.

Scotland has reached demographic maturity—its population is no longer increasing rapidly; it is reaching a position of population stability, with its implied threat of imminent decline. The difference between this war and the last is that the 1914–18 catastrophe struck a younger and more resilient population. If that country is the victor in war whose population growth-rate is least affected at the end, then in Europe there is but one that has won—the U.S.S.R., a population which in respect of growth potential is similar to what ours was a hundred years ago. Only a population with a young age structure can afford to indulge in the biological folly of war.

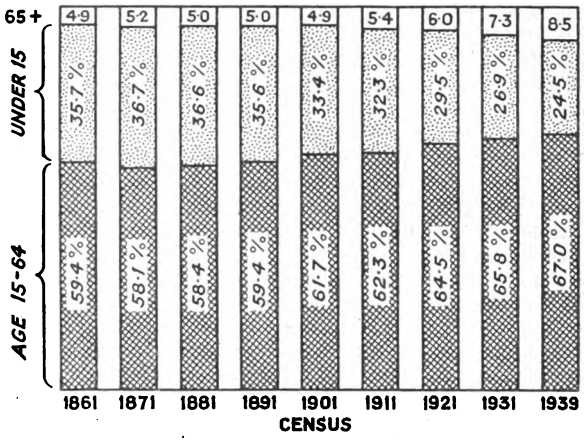
PLANNING

We as a people have to face the fact that we must begin to adjust our plans and policies for social reconstruction to a population that is becoming stationary in respect of total size and likely to decline. We must recognise too that our population is ageing and will come to include an increasingly larger proportion of the unproductive old. For the present, whilst the load of dependency is relatively light, there being relatively fewer youngsters among us and the weight of the old not yet being oppressive, we can afford to lavish care upon these dependent groups. Fewer children in the home can mean that these can receive a more expensive upbringing; fewer children in the community can mean that these can enjoy better educational, medical, and other public services. It is to be expected therefore that infant and child mortality will be further reduced and child health improved. The measures that will have to be used will be expensive and will take the form of improvements in housing, nutrition, special medical services, and education generally. These measures cannot be expected to yield dramatic results, for further reductions in infant mortality can be but a fraction of those already made. Purely medical conquests of disease are relatively cheap and are quickly gained; social measures for health maintenance and improvement, on the other hand, are relatively expensive and slow-moving. It can be accepted that the fewer children of tomorrow, better cared for, will cost both parents and State more than did the many of yesterday. With such further reduction in infant and child mortality it is to be expected that the sex ratio among those under 15 will become higher, for it is the more fragile male that will be more often salvaged.

These are matters worthy of consideration by those who clamour for increased reproduction. It is true that in the immediate future we could carry without embarrassment the extra load that these added immatures would furnish, and that such an infusion of youth would improve the nation's health; but, if we wish to multiply, we should do so now, for in two generations' time it may well be that the load of dependent senescents will be taxing our strength and make it difficult for us to shoulder any added burden.

The changing age structure is producing a shift in the age composition of the productive group, and a progressive decrease in the relative numbers of the younger workers is taking place. In industry, if not in agriculture, the men under 35 are in general the most useful; they are at the peak of their physical vitality and productivity; their stamina, agility, and ability to learn new techniques and to adjust themselves to new circumstances are greater than those of their seniors. It follows that an ageing labour force must introduce new problems in industrial psychology and industrial medicine, problems that we must be prepared to solve.

The present urgent need for industrial expansion will undoubtedly lead to an increased peace-time employment of women of the very age-groups that form the biologically most important section of the female population. Their relative numbers are shrinking pari passu with those of the males of the same age-groups. Employment of married women must force such to choose between work and children. Reconciliation between the economic and reproductive functions of women is likely to assume the proportions of a major social problem in an industrialised society like our own with a declining fertility. Up till recent times most women regarded gainful employment as a temporary affair from which they withdrew on marriage. But the inequality of the sex ratio, the



Changing age structure in Scotland, 1861-1939.

removal of men from industry by armies of occupation, technical developments expanding the number and variety of jobs that women can do just as well as men, and the experience of young women in the fighting services and in war-time factories are some of the more potent factors which have tended to make remunerative employment in industry an attractive alternative to child-rearing and to alter the rôle of the family as a social institution. It may be accepted as certain that the emotional needs of the male and female in respect of cohabitation and reproduction will continue to make marriage and home-making the preference of most individuals, but these needs can be met by a small number of children, insufficient for population maintenance and increase. Motherhood and employment in industry are largely incompatible; if more women are to be employed, then there will be fewer babies. Part-time employment, maternity leave, mothers' helps, free medical attendance, family endowment, day nurseries, communal restaurants, the abolition of drudgery from the house through the installation of machinery, all these should help to reduce or even remove this incompatibility, but it has to be remembered that they may defeat the very purpose for which they were devised. It does not follow in the least that because a woman has time to bear and rear more babies she will choose to do so. Pronatalist policies are invariably attached to programmes of economic security, since it is rightly assumed that economic provisions must underlie any successful policy of this kind. But economic security is surely not enough. It is as necessary to encourage the desire and the will to have children as to lighten the financial burden of parenthood; if this is not done, the economic encouragements to parenthood may well become stimuli which evoke even more eager search for greater personal comfort to the neglect of the welfare of the community as a whole.

It behoves us to watch with the greatest care all emigration projects for the strengthening of the bonds

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of Empire and for the reinforcement of the populations of the Dominions. These seek infusions of youth, the actually or potentially productive and reproductive. If we lose these and retain those aged 65 or over, we shall further disturb the relative proportions of our own supporting and supported groups, reduce our own reproductive reservoir, and accentuate the tendency towards population ageing and decline. If the Commonwealth is a reality, the load of dependency should be shared by all. If it is not, all that we can afford to export from our biological reserves are young women who are denied marriage and motherhood by the inequality of the sex ratio which obtains among the age-groups 25–45. The residence among us during the war years of Dominion and Allied soldiery, and the frequency of their marriage with our own young women, have been among the very few benefits that the war has conferred upon us. It is not improbable that history will show that this particular export of our biological wealth was of greater and more permanent value than was the shipment of whisky during the same period.

Up to now the decrease in the numbers of dependent youth has outstripped the increase of the dependent aged; hence there has been a progressive reduction in the proportion of dependents. This reduction will in the future—not too remote—be checked by the rising proportion of the aged, and the total load of dependency will become increased to bring in its train new social and medical problems. Furthermore, retirement from the labour force is tending to come at earlier ages than formerly, and the burden of pensions is tending to increase. Advances in medical knowledge may be expected to increase the numbers passing into the over-65 group, so that the decline in population numbers will for a time be averted, though only in a technical sense, since this will be achieved only at the cost of weighting the population heavily in the higher age-groups. It is to be expected that large numbers of individuals will reach ripe old age in a world in which the aged have lost their former social status. The problem of the care and support of the aged, not serious as yet in its magnitude, will assume considerable importance after a time, and for its solution wise social engineering will be demanded. Even now we should be active in attempts to define exactly the needs of the senescent, and considering plans to provide a suitable environment within the community for those who, because of their age, have become self-insufficient and endure an increasing loneliness and aloofness, and whose interests and needs differ from those of their fellows in the earlier age-groups.

There is in fact considerable activity in this field of inquiry at the present time on the part of certain scientific groups, official bodies, and charitable organisations. The Club for Research on Ageing in this country and the Gerontological Society of America, for example, are eagerly striving to disclose the nature of the processes of ageing and to encourage and coördinate research in the fields of gerontology and geriatrics. The report on rehousing of aged persons of the Scottish Housing Advisory Committee to the Department of Health for Scotland (1938), the report of the Royal College of Physicians of London on design of dwelling-houses (1942) to the Ministry of Health, that of the Assistance Board (1945) to the Ministry of National Insurance, and the institution of the Nuffield Survey Committee are instances of the expanding academic and official interest in these matters. The number and variety of the voluntary organisations that are active in providing care for the aged are large; they have built up a magnificent record of public service. Examples are provided by the Old People's Welfare Committee of the National Council of Social Service, the Bucks Old People's Welfare Committee, the Church Army's Sunset Homes, Queensberry House, Edinburgh, the Edinburgh Old People's Welfare Council, and the Scottish Council of Civil Service.

It is from sources such as these that we must derive our knowledge of the biological, social, and economic needs of the aged, for such knowledge must come from the old themselves. That these needs differ widely is certain, for just before the war, for example, nearly a third of those over 65 and a fifth of those over 70 were not in receipt either of State pensions or of public assistance. Some of the aged are maintained by their own savings, by their relations, or by pensions from sources other than the State. Many are parasitic on their own unmarried daughters. This peculiar form of parasitism can have the most degrading effects on the host and should be listed among the dangerous trades. Some are in almshouses, some in institutions, public and private, a few in hostels—e.g., the war-time hostels of the Friends Relief Service. It is generally agreed that the hostel should replace the large institution for the more or less able-bodied aged, but it is unlikely that these can claim a high priority in building programmes. It is agreed also that the aged should not be segregated but should live as part of the general population and so retain contact with the communal life.

To the aged the State has been giving social security in increasing measure; to them enlightened public and private philanthropy has given personal security based on humanitarianism. Education has endowed most of them with the ability to enjoy the pleasures of the mind in their retirement. Enough is known already concerning their needs to permit the architect, engineer, and local authority to plan and to begin to translate planning into action. But much remains unknown as yet; systematised investigation is needed. We of Scotland would be acting wisely if we now set up a bureau of information concerning old age, its personal and social problems, for the use of Government departments, local authorities, doctors, social workers, and old people. In our society even now there is as great a need for the guidance of the senescent as there is for child guidance. A nation-wide gerontological survey should be undertaken on the lines of the survey of the Nuffield Foundation, and investigation by medical scientists in the field of geriatrics encouraged with particular reference to the so-called degenerative disorders, for as yet we know far too little of the biology of the ageing, of the clinical problems of senescence, and of the socio-economic problems of an ageing population, to endow our special contribution to the construction of a new and better social order with any great value. It is our privilege and our responsibility as a profession to take such steps as are necessary to see to it that this knowledge is secured by us and made available to those whom it must concern.

WHEN the Volunteer Car Pool, organised by the W.V.S. during the war, ended last July the St. John Ambulance Brigade, British Red Cross Society, and W.V.S. combined to organise the Hospital Car Service, and since August some 20,000 patients have been taken to hospital each month, most of whom would otherwise have had to forego treatment. Now the service needs 10,000 more owner-drivers who could help once a week, once a fortnight, or even once a month. They will receive petrol coupons and a mileage allowance. Volunteers may obtain further information from any St. John Ambulance Brigade, British Red Cross, or W.V.S. office.

THE annual general meeting of the Society for the Relief of Widows and Orphans of Medical Men will be held on Wednesday, May 8, at 5 P.M. Any member who has been serving in the Forces and is now demobilised is asked to inform the secretary and notify his present address. Membership is open to any registered medical man residing within 20 miles of Charing Cross. Relief is granted only to the widows and orphans of deceased members. Full particulars may be obtained from the secretary of the society at 11, Chandos Street, London, W.1.

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AIR HYGIENE IN DRESSING-ROOMS FOR BURNS OR MAJOR WOUNDS

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(*Concluded from p. 565*)*

INCIDENCE OF ADDED INFECTIONS IN BURNS UNIT

Acute and Clinically Manifest Infections.—The incidence of acute clinical infection of the burns, developing after admission, has been remarkably low. During the 6 months Jan. 1–June 30, 1945, 860 dressings† were done on 103 patients (89 new cases plus 14 present at the beginning of the period). Of these only 7 cases developed acute infection: 3 due to hæmolytic streptococci and 4 to *Staph. aureus*. In a few other cases, usually during the sloughing period, there was some low-grade infection with a little pyrexia but no local signs of acute inflammation. The organisms predominating on such burnt areas have usually been coliform bacilli, staphylococci, *B. proteus*, *Ps. pyocyanea*, or *Strep. viridans*. One such patient, with a 70% third-degree burn, who survived for 3 months, ultimately died of infective endocarditis (*Strep. viridans*). This was the only death in which infection played a major part.

Silent Infections.—Most cases of added infection were of the silent type—i.e., not clinically manifest and only detected by cultures of the swabs taken at each dressing.

SOURCE OF ADDED INFECTIONS

Since the object of a special ventilation system is to avoid the transference of infection during wound dressings, a serious attempt was made to determine how far added infections were due to transmission of infection in the dressing-room or in the wards, where no dressings were carried out but where cross-infection may have taken place owing to imperfect covering by dressings in difficult or restless cases.

For this purpose complete records were kept of all dressings done in the dressing-station for the 6 months mentioned above, with names of all those present and notes of the condition of each burnt area and its treatment. A swab was taken from each lesion, every time it was dressed, for bacteriological examination. Throat swabs were also taken on admission of each patient and once a month from all staff and patients. The identity of strains of hæmolytic streptococci was ascertained, if possible, by serological tests done by the streptococcus typing laboratory of the Medical Research Council.

The *principles used* in assessing the probability that infection took place in the dressing-room were as follows:

(1) It was assumed that the transmission of cross-infection of any given organism liberated in the dressing-room was much more likely on the day on which the organism was liberated than on a subsequent day. We think this justified by the use of a heavily oiled floor and the thorough clean-up of the room after each day's dressings. Owing to these measures and the forced ventilation very little dust remained in the room.

(2) Therefore, if cross-infection was taking place in the dressing-room, the patients dressed on the same day as an infected case, but subsequently to it, would be more likely to show an added infection at the next swabbing than patients who had been dressed before the infected case. If no such increased frequency of added infection was found, the probability that appreciable cross-infection took place in the dressing-room must be small.

(3) Owing to the difficulties of keeping burns of the face, neck, shoulders, and lower part of the trunk effectively covered with dressings, the probability of these cases acquiring added infections in the ward was greater than in cases with burns of the limbs. This is well shown by the fact that of the 16 cases of added infection by *B. proteus* 15 were of this difficult-to-cover class. In analysing our results the two categories are considered separately.

(4) For the purposes of this inquiry we have taken account only of added infections by 3 easily recognised indicator organisms: β-hæmolytic streptococcus, *Ps. pyocyanea*, and *B. proteus*. The term "added infection" is used to connote the detection of 1 of these 3 organisms on a burnt area *at any time during the patient's stay in hospital*, the admission swabs having been negative for that area.

In limiting our observations to the 3 indicator organisms it is not intended to imply that there were no other added infections. There have been many by staphylococci, undifferentiated types of micrococci, and coliform and diphtheroid bacilli, but we have not attempted to trace the source of these, chiefly because, unlike the 3 indicator organisms named, they are often found on normal human skin and, despite all precautions, may very easily find their way on to the burnt surfaces, if these do not heal within a few days. Except *Staph. aureus* and perhaps the coliform bacilli, they seldom seemed to have any appreciable effect on the healing of the burns.

β-Hæmolytic Streptococci.—On 59 occasions the wound being dressed was already infected with this organism. After deducting these from the total of 860 dressings, there were left 801 dressings after which 16 cases of added infection were detected, of which 9 were of the difficult-to-cover class. None of these patients had been dressed subsequently to a patient infected with the organism concerned. Hence it is improbable that such infection was transmitted in the dressing-room.

Ps. pyocyanea.—834 dressings were done on patients not previously infected with this organism and 36 on infected cases; 8 added infections were detected, 6 of them in difficult-to-cover cases. Here again none of these patients had been dressed subsequently to a patient infected with the organism concerned.

B. proteus.—763 dressings were done on patients not previously infected with this organism and 97 on infected cases; 16 cases of added infection were detected. Four of these patients had been dressed subsequently to a patient infected with *B. proteus*, and this at first sight suggests cross-infection in the dressing-room, but a careful analysis of all the factors concerned shows that that source of infection is by no means certain.

BURNS DIFFICULT TO COVER

No. of dressings not following a proteus-infected case (on the same day)	148
Cases of added infection not following a proteus-infected case (on the same day)	12
Probability of acquiring a proteus infection ..	8·1%
No. of dressings following an infected case ..	35
Cases of added infection following a proteus-infected case	3
Probability of acquiring a proteus infection ..	8·6%

The figures thus show a slight increase in the probability of infection in cases dressed subsequently to a proteus infection, but, owing to the small numbers involved, the difference is not significant. A reduction of 1 in the

* In the first part of this paper the authors gave evidence of the bacterial pollution of the air which usually accompanies surgical dressings and the disturbance of bedclothes and may therefore be a source of cross-infection. They also showed how this polluted air can be rapidly eliminated by forced ventilation. The illustrations and references appeared in the first part of the paper.

† Figures for the whole year, which have become available since this paper was sent in for publication, show that 1457 dressings were carried out in the dressing-room. For the reasons set out below it appears improbable that infection by a hæmolytic streptococcus or by *Ps. pyocyanea* was transmitted to any patient in the process of dressing.
A full report on the added infections will be published later.

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second group of infected cases would have made the difference of opposite sign.

BURNS EASY TO COVER

No. of dressings not following an infected case ..	492
Cases of added infection not following an infected case	0
No. of dressings following an infected case ..	88
Cases of added infection following an infected case	1

Here again there is a difference of 1 case in the direction that suggests a possibility of infection in the dressing-room, but the fact that there was only 1 case shows that the probability of cross-infection in burns which were easy to cover was very small, even in patients following infected cases.

CONCLUSIONS ON PLACE OF INFECTION

The above data seem to us to justify conclusions as follows:

(1) There is a very striking difference between the number of added infections in cases difficult to cover (15 infections in 183 cases=8·2%) and in cases easy to cover (1 infection in 580 cases=0·18%). Since the latter cases included many extensive burns of the limbs, the difference does not appear to be due to any difference in average size of burn. It is, we believe, due to the imperfect covering afforded by dressings of the difficult class, owing to anatomical considerations, or to their working loose in the interval of several days between visits to the dressing-station.

(2) Since infection in the dressing-room would be expected rather in proportion to the size of the burn than to the difficulty in keeping it effectively covered, the above difference shows a strong probability that the great majority of the 16 added infections with *B. proteus* took place in the wards rather than in the dressing-room.

(3) This conclusion is supported by the absence of any significant increase in the probability of infection found among cases dressed subsequently to a case already infected with *B. proteus*.

(4) If the added infections with all 3 indicator organisms are taken together, the small total number of cases in patients who had been dressed subsequently to an infected case still further supports this conclusion.

VALUE OF VENTILATION IN LIMITING INFECTION IN THE DRESSING-ROOM

In view of this evidence it appears that remarkably little infection was transmitted in the dressing-station during the 6 months under review.

There remains the question how far the forced ventilation contributed to that result. It is impossible to give an unequivocal answer, as there is no doubt that the manner in which the dressings have been done has played some part. A very strict ritual has been observed throughout the period. Most of the dressings have been done personally by Mr. J. McK. Duncan, working with a team of 3 assistants; the strict no-touch technique advocated by the Medical Research Council memorandum[17] has been adhered to; and nobody has been allowed in the room during dressings without sterile gown, cap, and mask and laundered over-boots. The floor of the dressing-station has been oiled once a week. The bed-linen on patients' beds has been completely covered with freshly laundered sheets before they come into the dressing-station. And last, but by no means least, penicillin has been used on all cases, both as a prophylactic cream on admission and for the rapid elimination of any subsequent streptococcal infection.

To obtain definite evidence that these other measures did not of themselves suffice to prevent the transmission of airborne organisms from one patient to the next, it would have been necessary to adopt all these other precautions for a period and to use the dressing-station as described earlier but with the ventilation plant switched off. That plan was considered in the beginning and was rejected. It did not seem justifiable, in view of the facts already known to us pointing to the danger of airborne infection and our previous experience of the great difficulty of eliminating streptococcus infection from a ward full of burned patients once it is established.[4] Moreover, a recent incident had been a warning. A few weeks before the period of investigation a series of dressings were done with the ventilation switched off, to compare the amount of air contamination with that occurring with full ventilation. We thought the wards were free from streptococcus infection at the time, but we were mistaken, for the second plate exposed in the slit sampler grew 2 colonies of hæmolytic streptococcus, and during the subsequent 2½ hours of air sampling 5 of the 9 plates exposed yielded a few colonies—16 in all. (Of these 16 colonies 11 were identified as type 14; the other 5 could not be typed with certainty, but 3 of them gave some reaction with serum of type B 3264. The type-14 strains were sulphonamide-resistant.)

Eight patients came into the dressing-station for treatment while the air of the room was thus contaminated with streptococcus. Of these, 4 men (all from one ward) developed acute streptococcal tonsillitis (type 14) within a few days, and 2 of their wounds were found to be infected with the same organism at the next dressing. Three other patients in the ward became carriers of this type, and 1 of them developed tonsillitis a week later. One other patient in the ward also developed tonsillitis, due to another strain, type B 3264.

The source of the streptococci in the air of the dressing-station on that day remains uncertain, as we were unable to discover any carrier when the epidemic started. It seems probable that they were disseminated by dust which had become contaminated in some way by a nurse who had gone down with tonsillitis 3 days before and had left the hospital. When she returned 10 days later, her throat swab yielded type-14 streptococcus. It is possible that this nurse or some other undetected carrier had spread this strain round the ward in which the tonsillitis occurred; but, as this was a large ward with good cross-ventilation, it seems at least possible that the first patients to go down with it acquired their infection in the dressing-station. However that may be, there can be no doubt that all the wounds dressed in the dressing-station with no ventilation were exposed to the risk of cross-infection from the air.

On another occasion during a series of dressings with the ventilation switched off we observed a similar persistence of pathogens in the air—this time of *B. proteus*. It is unusual to encounter even a single colony of this organism during air sampling, but on this occasion 10 colonies grew on 2 plates during the dressing of a small burn infected with that organism, and it appeared also on 2 plates exposed respectively 30 and 50 min. after this patient had left the dressing-station. Such persistence of pathogens in the air was never observed with the forced ventilation.

To sum up, the evidence suggests to us that the measures adopted to prevent transmission of infection from case to case in the dressing-station were remarkably effective, and that the forced ventilation played an important part in that success.

MICRO-ORGANISMS FOUND IN THE AIR OF THE DRESSING-STATION

The predominant types grown on plates exposed during the dressing of patients were, for the most part, organisms characteristic of human skin flora—namely, micrococci of varied colonial types, white staphylococci, and diphtheroid bacilli. All these and often sarcinæ are commonly grown from patients' bedding, bed-clothes, and bandages.

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When a heavy seeding of organisms on the plates coincided with disturbance of a patient's dressings, the bacterial types predominating were often those most abundant on the wound as already shown in fig. 7 and in the lower curve in fig. 1.

It sometimes happened, however, that the cloud of organisms liberated from a dressing was largely composed of a bacterial type which was not grown on cultures made from the subjacent wound. Thus, on one occasion, the aerobic spore-bearing type *B. cereus*, which is seldom found in cultures from burns, was disseminated in very large numbers from bandages round the shoulders of patient E (fig. 1) (the bandages had been sterilised before use but had been on the patient for several days).

Among known pathogenic species recovered from the air of the dressing-station, *Staph. pyogenes aureus* has been present most often and in the largest number. Thus, among 68 sedimentation plates exposed for periods of 1–3 hours during dressings, no less than 47 showed some colonies of this staphylococcus, sometimes as many as 20–40.

The β-hæmolytic streptococcus has been found on only 11 occasions, but the number of streptococcus-infected wounds has been small compared with the number infected with *Staph. aureus*. The types of hæmolytic streptococci found have usually corresponded to those present on the burns of patients being treated in the dressing-station.

B. proteus and *Ps. pyocyanea* have also been found (in the air) infrequently—e.g., proteus on 15 occasions, and pyocyaneus on 3 occasions. Once, during the dressing of a burnt hand infected with proteus, we grew no less than 33 and 44 colonies of that organism from 2 successive plates in the slit sampler.

DISCUSSION

Pathogens or Other Organisms as an Index of Air Contamination.—Some workers consider that the presence of large numbers of airborne organisms is of little importance, even in hospitals, unless they include types recognised as human pathogens. Others hold that the total bacterial content of the air gives the best general indication of its pollution, whether pathogens are or are not present on any particular occasion. It seems important to decide correctly between these opposed view-points if there is to be sound progress in air hygiene. The following considerations are relevant to this issue :—

(1) The frequent presence of pathogens in the air of occupied dwellings is abundantly proved by the prevalence of respiratory diseases. Further, it seems safe to assume that the concentration of such airborne pathogens is usually greater in hospitals, where patients with respiratory and skin diseases and surgical infections are congregated together, than in normal dwellings.

(2) An apparent absence or scarcity of human pathogens on a blood-agar plate used for air sampling may be illusory. We may be misled if a single sample of air, rather than a series of samples, is tested. We must also fail to detect many pathogens because our cultivation methods are imperfect. Dry aerobic blood-agar plates, although convenient and suitable for the growth of most of the common pathogenic bacteria, will not grow many of the organisms commonly present in the mouth, besides many of the more delicate pathogens, such as gonococcus, meningococcus, *H. influenzæ*, and pneumococcus, and the slow-growing organisms, such as the tubercle bacillus. None of the pathogenic viruses can be detected by ordinary methods of air sampling, nor the strict anaerobes.

(3) In occupied buildings the presence of a large number of airborne organisms usually indicates the probability that large numbers of pathogens will be present if infected persons happen to liberate them. On the other hand, the presence of clean air in an occupied place indicates that either ventilation or air disinfection or dust control is good and therefore even if pathogens are liberated they will be removed before reaching any large concentration. Hence the total count of airborne organisms is usually a rough guide to the potential count of pathogens which may be made when diseased persons are present.

(4) The terms "pathogen" and "non-pathogen" are apt to be misleading, unless used with clear recognition of the facts that (*a*) there is no sharp line dividing these two classes, and (*b*) our present knowledge does not often allow us to assert with assurance that any given strain will be non-pathogenic for man in all circumstances. The viridans group of streptococci are commonly referred to as non-pathogenic but, to those who deal with bacterial endocarditis, they appear formidable pathogens; nor is their pathogenicity always limited to that condition. Similarly, the coliforms of the human intestine are usually regarded as non-pathogenic, but few clinicians would deny their pathogenic rôle in the urinary tract; and it would be rash to assert that their proliferation on recent burns was of no consequence. Again, organisms usually regarded as non-pathogenic—e.g., the white staphylococci of the skin, which are very commonly found in air sampling—can cause trouble when they multiply in a hæmatoma or in incisions closed with undue tension (stitch abscess). We suggest, therefore, that the classification of organisms into pathogens and non-pathogens is too crude and should be abandoned in favour of a grouping into pathogens, potential pathogens, and non-pathogens. Types which can be unhesitatingly referred to the last category are few in the present state of knowledge.

All the above considerations lead us to the conclusion that total counts of airborne bacteria, made under appropriate conditions, do give a useful indication of the degree of bacterial pollution of the atmosphere.

The alternative suggestion that *Strep. viridans* should serve as the indicator organism of air contamination has been put forward by several workers [3 9 26] on the ground that human (or human plus animal) saliva is probably the chief source of such organisms in the air. Unfortunately many strains of this organism are very susceptible to drying and are not easily cultivated on simple media,[21] so this proposal has not been widely adopted.

In the future, bacteriological methods of air sampling may be developed which will serve better than the blood-agar plate of today for the detection of a large range of human pathogens. In the meantime we suggest that a practical policy should follow the lines generally adopted in food sanitation, food being rejected as unwholesome and potentially dangerous if it is dirty, whether pathogens have or have not been demonstrated in it. It is the present practice of hospitals everywhere to ascertain and to verify periodically that their water- and milk-supplies are satisfactory. Should they not also ascertain, by actual tests from time to time, that the air-supply to their operating-theatres and dressing-stations is bacteriologically safe?

As a working guide to such safety we suggest the following. Taking as an index of contamination the total number of bacteria-carrying particles per cu. ft. of air that will grow to visible colonies after 24 hours on 5% blood agar at 37° C, reasonable standards of impurity in surgical practice would be :

	Maximal no. of bacteria-carrying particles per cu. ft. of air during quiet periods
For minor operations or dressing small wounds	20
For major operations on tissues with normal resistance to infection	10
For dressing burns or for operations on the central nervous system, &c.	2 to 0·1 *

* According to conditions.

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These figures are intended to indicate the values below which the counts should fall fairly rapidly *when the theatre or room is quiet*—i.e., during prolonged quiet operations or in between successive patients. It is at present very difficult to attain this standard during active movements in the room. We have no doubt that better standards than the above can occasionally be reached now and will be attained quite commonly in the future as air hygiene improves.

Optimal Ventilation for a Ward Dressing-room.—Our tests have convinced us that a plenum system of ventilation, with warmed air entering near the ceiling and leaving at floor level, has great advantages over natural ventilation, at least in a cold or temperate climate. Three points should be emphasised:

(1) The plenum system (by which clean air is pushed into a room at a trifling positive pressure) is immensely preferable to the use of an exhaust system which creates a slight negative pressure and so tends to suck in dirty air from under the door or other undesired sources.
(2) The clean air should be pushed in at the top of the room and out at the bottom, so that the downward movement of the air may accelerate the tendency of suspended particles to fall to the floor. This effect can be very useful at high rates of air change, such as 30 per hour and upwards (as we have shown by laboratory tests), and must have been of some use even in our own dressing-room, although the airflow of 10 changes per hour caused only a slow downward current of about 2 ft. per min. that could only affect the normal vertical currents to a small extent.
(3) The incoming air should be warmer than the walls of the room, or at least it should not be colder. If cold air is introduced high up in a room, it tends to fall to the floor in localised streams which are felt as unpleasant draughts. This not merely annoys the occupants but also reduces the effective rate of ventilation of the room, since much of the fresh air escapes without mixing with the dirty air already present. In contrast to this, when warm air is introduced high up it tends to form layers which are pushed downwards too slowly to cause a draught and which push the dirty air before them as they go. Mr. A. Fowler has suggested to us the term "piston effect" for this type of airflow. It is obviously the ideal at which one should aim.

The optimal rate of airflow depends chiefly on the availability of steam for heating the air in winter and of funds for providing the plant. Provided that distribution is uniform and the air suitably warmed, draughts are not likely to be troublesome at 60 turnovers per hour or even higher rates (60 turnovers per hour gives a downward velocity of 12 ft. per min. in a room 12 ft. high). These rates will cause very rapid disappearance of bacteria and are found in laboratory tests to give the piston effect—i.e., sudden disappearance of a bacterial cloud as the top air is displaced downwards past the sampler.

On the other hand, plant to give such rates must be costly, and our data show that very fair results can be obtained at only 10 turnovers per hour, provided that a 5 min. wait is enforced between the exit of one patient and the entry of the next. For most situations we think a rate of 20 to 30 turnovers per hour is likely to prove a wise choice.

Degree of Air Filtration Needed.—This again must be decided by balancing expense against the desirability of maximal purity of the air.

When a hospital is close to a large stable or dairy farm, and therefore dust from animal fæces is likely to arise in quantity, a high degree of filtration would seem justified. (In any case it is desirable for the air intake to be at the highest practicable level, a point which is sometimes overlooked in hospital ventilating plants.) In most sites there seems reason to believe that airborne pathogens are rare at a level of 5 or 10 ft. above hospital roofs, and that simple filtration will be adequate for safety. It is certainly much better to instal an economical filtration plant with cloth or wool filters than to instal no ventilation plant at all.

Fine filtration greatly increases the cost of a plant owing both to the first cost and renewal costs of the fine filters and to the need for fans delivering higher pressure. We therefore suggest the following as desirable where questions of cost are serious:—

(1) For ordinary sites and ordinary theatres or wound dressing-rooms (using an intake 30 ft. or more above ground) coarse filtration sufficient to reduce the prevalent airborne flora to 1 bacteria-carrying particle per cu. ft. or less. Filters to transmit not more than 20% of the bacteria-carrying particles found at the intake.
(2) Where the air is likely to carry an unusual number of pathogens, or where exceptionally pure air is important—e.g., in operating-theatres used chiefly for brain or chest surgery—filtration adequate to reduce the contamination to less than 0·1 per cu. ft.

In the future it may be found that other methods of purification, such as electrostatic precipitation or sterilisation by heat in a low-temperature furnace, are worth considering.

The control system of a ventilation plant must be costly if made automatic (as in this unit) so as to give a predetermined constant humidity and temperature. However, for most clinical purposes this is unnecessary, and simple hand-controlled steam valves can be used without difficulty and at much lower initial cost.

Relative Advantages of Ventilation versus Air Disinfection.—Air disinfection by either chemicals or ultraviolet light has two real advantages over good ventilation: its first cost is much less, and it is easy to make it more rapidly effective against fresh moist finely divided particles carrying bacteria or viruses. However, both chemical agents and ultraviolet light in concentrations low enough to be harmless to human beings are much less efficient against dry dustborne bacteria and spores. Ultraviolet radiation has been advocated strongly by Hart [12 13] for use in operating-theatres. We regard it as a useful adjuvant to good ventilation, but not a good substitute for it, especially when used in intensities low enough to make the use of goggles unnecessary. Modern chemical air disinfectants can certainly be useful, especially during respiratory epidemics; but, as with ultraviolet light, we think that chemical disinfection should be adjuvant to good ventilation and not a substitute for it.

SUMMARY

The bacterial content of the air in the dressing-room of a burns unit has been studied with especial reference to the danger of transmitting airborne infection from one patient to the next.

To reduce this danger a forced ventilation plant was installed, giving highly filtered air at about 10 changes per hour (later raised to 20 changes per hour).

A very low incidence of added infections among the burnt patients was maintained during 6 months of this study, and analysis suggests that infection by streptococci was not transmitted in any instance in the course of dressing. It is not claimed that this was entirely due to the special provision made for dressing patients in clean air, but it is considered probable that that played an important part.

This result, coupled with extensive studies on the rate of disappearance of airborne organisms from the room, leads us to conclude that a supply of fairly clean air equal to 10 changes per hour is adequate for reasonable safety, provided that an interval of at least 5 min. is enforced between the exit of one patient and the entry of the next, and that unoiled blankets are not exposed in the dressing-room. However, an air-supply of 20 to

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30 changes per hour is considered preferable, where practicable.

Standards of air hygiene are proposed as practicable and desirable for theatres and dressing-rooms. It is suggested that hospitals should satisfy themselves about the purity of the air in their operating-theatres and dressing-stations just as they do of their water- and milk-supplies.

A new technique of sampling air for bacteria is described which permits of accurate determination of the moments at which clouds of bacteria are liberated. This has shown that large numbers of airborne bacteria are often liberated when dry bandages and wool are removed from a patient. These clouds sometimes contain many pathogens. Large clouds may also be liberated by the movement of pyjamas or other bed-clothes that have been used for some hours.

Data are given confirming the view that unoiled blankets should not be allowed in any surgical dressing-room or theatre.

Acknowledgments are due to the Accident Hospital, which has made this work possible, and in particular to Mr. W. Gissane, its surgical director, and to Mr. J. McK. Duncan, who has supervised the clinical treatment of these patients and has performed most of the dressings; to Mr. A. Fowler and Mr. Craven, of the Carrier Engineering Co. Ltd., for continual help and advice; to Sister Magee and the nurses under her, whose loyal coöperation has contributed much; to Dr. Dora Colebrook, Messrs. Maxted and Heimer, who by typing the streptococci have helped us in many cases to trace their spread; to Dr. St. John Brooks and to Dr. T. Gibson, of the College of Agriculture, Edinburgh, who have helped us with the identification of the airborne spore-bearers; and to Mr. W. Cawston, who has been responsible for most of the routine bacteriology.

TREATMENT OF OPEN FRACTURES OF THE FEMORAL DIAPHYSIS

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WHEN treating open fractures the surgeon is often faced with conflicting claims—those of the fracture and those of the associated infection. Where treatment of an infection threatening the life of the patient has been given first consideration, it is common to see pseudo-arthrosis as a late complication of fracture. Conversely, septicæmia, amputation, and death may be the price paid by the patient whose fracture is corrected without regard to infection. Modern surgery by attempting to treat both infection and fracture has raised the proportion of total cures.

GENERAL CONSIDERATIONS

Most of the current methods of treating open fractures are based on the observation that hypertonia and muscular contractions tend to cause the bony fragments to override or become otherwise displaced. Böhler and Zupinger both advised that the limb should be put up with the proximal joints in semiflexion—the position in which maximum relaxation of muscles is obtained—and that the muscular spasm should be overcome by local anæsthesia. Other surgeons achieve the same relaxation by spinal or general anæsthesia, still maintaining the semiflexed position to overcome the muscular hypertonia. By this double precaution the traction and counter-traction that the reduction of the fracture requires are greatly facilitated, or rendered unnecessary.

The position of semiflexion is maintained, in the treatment of most fractures, with a plaster cast. Yet in fractures of the femur, the most serious of all, this rule is not followed.

The patient normally passes through three phases. The first is characterised by local numbness with hypotonia, and general traumatic shock; at this stage the fracture can usually be easily reduced without much pain. This stage lasts at most a few hours, and is followed by a phase of hypertonia and muscular contraction; it is in this second phase that the fracture usually reaches the surgeon. Development of the third phase depends on the treatment the patient receives. If

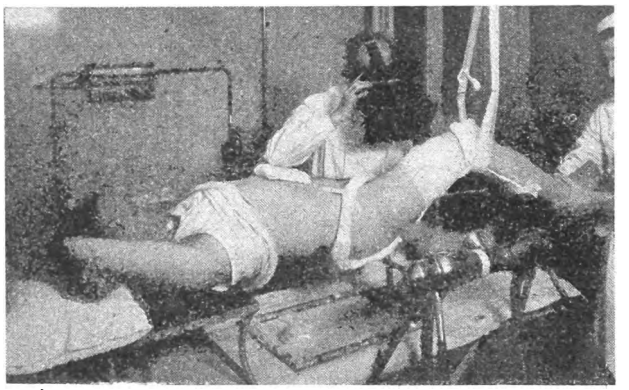

Fig. 1—Cramer splint in position; limb suspended with bandage (note wire spreader). Radioscopy before plaster is applied.

he is moved, even a little, the muscles contract as a defence reaction: that is, the patient remains in the second phase. If he is not treated, or if he is submitted to continuous movement, as he may be during a long journey, he develops spasm of the musculature of the wounded limb, associated with continuous fear of pain, and probably with toxic absorption from the wound, the site of the fracture, and the spastic muscles. The result is muscular and psychical exhaustion, leading to the third phase: the patient, tired and intoxicated, leaves the limb to its fate, relaxing his muscles. In this phase traction and counter-traction are easy, and in many cases the fracture can be reduced painlessly merely by placing the limb in a good position. Moreover, it is possible to maintain the position because the patient, as soon as he feels the fracture at rest, falls into a deep sleep. Between the second and the third phase there is usually an intermediate stage of pre-exhaustion in which the muscles contract sporadically and feebly; at this time the patient will relax his muscles as soon as the limb is immobilised. A knowledge of the characteristics of the third phase will often prove of great service to the surgeon treating exhausted casualties from the battle-field, or patients brought in long distances from rural districts.

The common factor in the treatment of both fracture and infection is rest; and rest is guaranteed by plaster. Why, then, is plaster not used more freely in the treatment of open fractures of the femur? The difficulty of applying dressings was originally a deterrent. The plan of cutting a window in the plaster over the wound has been tried, but focal œdema often causes the bony fragments to deviate towards the window; and sepsis is encouraged by the sodden edges of the plaster. Böhler recommends exposure of the wound, to the open air, through the window, but this does not prevent focal œdema or reinfection from without. By using the method described here it is possible to treat open fractures of the femur, after debridement, by the closed plaster technique.

APPLYING THE PLASTER

If a patient needs operation, he is treated for shock or for post-traumatic intoxication; and, as soon as his recovery is sufficient to justify it, he is placed on a pelvic rest (fig. 1), and his body is bandaged from a few cm. above the costal border down to the toes, wherever the plaster is to be applied, the bony points and the

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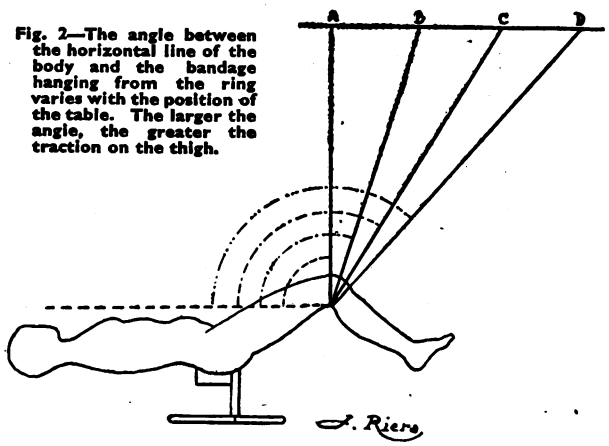

Fig. 2—The angle between the horizontal line of the body and the bandage hanging from the ring varies with the position of the table. The larger the angle, the greater the traction on the thigh.

principal supporting regions being protected with padding. A Cramer wire splint, as broad as the thigh and leg, and long enough to reach from the middle of the calf to rather more than half-way up the thigh, is bent to an obtuse angle and applied to the back of the leg (fig. 1). The angle should have no sharp edge but should be curved (fig. 3), so that the leg is supported throughout its length by the splint, except over the popliteal hollow which it bridges, thus protecting the vessels and nerves of this region from contusion. The Cramer wire splint is later lined with a thick plastered slab wide enough to overlap it, and this in turn is lined with cotton-wool or felt padding.

About a metre over the injured knee a ring hangs from the ceiling, and through this ring a bandage which has been well stretched by hand is passed. This bandage passes under the knee and outside the splint, which protects the popliteal space; the ends are knotted on one side and as high up as possible, so that the leg rests on the splint at an angle similar to that produced by a Braun splint (fig. 1). To avoid pressure on the sides of the knee a spreader, which may itself be a strip of Cramer splinting, is placed between the two strands of bandage (figs. 1, 5, and 6). The lower the spreader is placed, the freer the knee. During plastering the two sides of the bandage should adapt themselves to the sides of the knee without pressure on the soft tissues, and the proper fitting of the bandage to soft parts regulates the height at which the spreader must be placed. The use of the spreader raises the leg because it shortens the distance between the knee and the ring; later the stretching of the bandage compensates for this. Radioscopy is a guide, at this stage, to the type of fracture and its exact position.

The bandage attached to the ring exerts indirect traction on the distal end of the fracture, and this traction depends on the angle which the axis of the body forms with the bandage. In fractures of the lower third without overriding—that is, with no shortening of the leg—the bandage must be perpendicular to the body; but the more the overriding or shortening (that is, the higher the fracture), the farther must be the table on which the patient is lying from the ring, so that the bandage forms an obtuse angle with the body (fig. 2). In such cases the curve of the Cramer splint is placed lower down almost on the upper third of the leg, so as to force the leg to lie parallel to the plane of the table. A levering movement is used, similar to that used by Böhler and Edshanelidze to reduce luxation of the hip. When doing this for a fracture of the right leg, the surgeon holds the calf with his left hand placed flat, while he grasps the instep with his right hand; his left hand draws the whole of the thigh towards him. (Possibly a belt passing round the thigh and the neck of the surgeon could be used to do this.) The right hand carries out the levering movement. When the left leg is injured, the position of the surgeon's hands is reversed. The effort required is never excessive, but

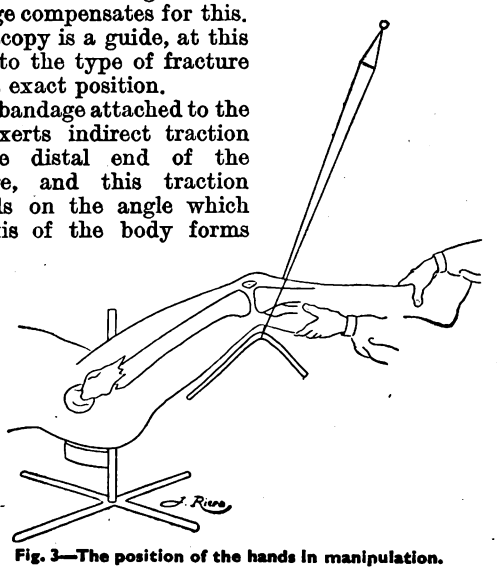

Fig. 3—The position of the hands in manipulation.

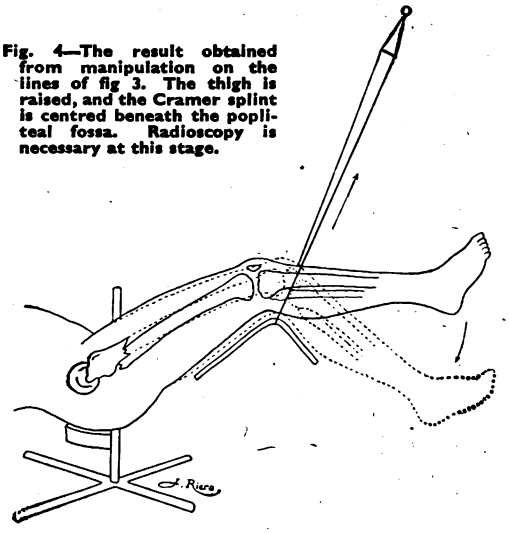

Fig. 4—The result obtained from manipulation on the lines of fig 3. The thigh is raised, and the Cramer splint is centred beneath the popliteal fossa. Radioscopy is necessary at this stage.

the manipulation needs to be done by an experienced man, able to hold the leg without undue force in the new position after the reduction. Manipulation is made easier by the support provided by the Cramer splint and by the oblique pull of the bandage, which acts as a continuous extension apparatus, drawing the whole of the thigh upwards. The result of these combined measures is that the knee gradually moves to a higher level, the leg meanwhile adapting itself to the splint (fig. 4).

The sound leg is measured, and then the fractured leg is measured in its new position; the same tape is used, and errors due to the angles of the joints are avoided as far as possible. If the lengths of the legs correspond, the fracture is radiographed in two planes. If the position is unsatisfactory the leg is manipulated under fluoroscopy until perfect reduction is obtained, and the splint is then immediately fitted into the popliteal fossa.

Plastering is done in one or two stages. If it is done in one stage, one assistant takes charge of the thigh, another of the body, and another of the knee, leg, and foot. If two stages are needed (this depends on the success of the reduction), the first plaster is applied from the ribs to just above the knee and is reinforced with Cramer splinting, especially at the level of the hip-joint; in the second stage the rest of the leg is plastered down to the toes. When the plastering is half done, good reduction is confirmed by radiography (fig. 5).

If the position is not perfect at the first screening of a two-stage plastering, it is usually easy to complete

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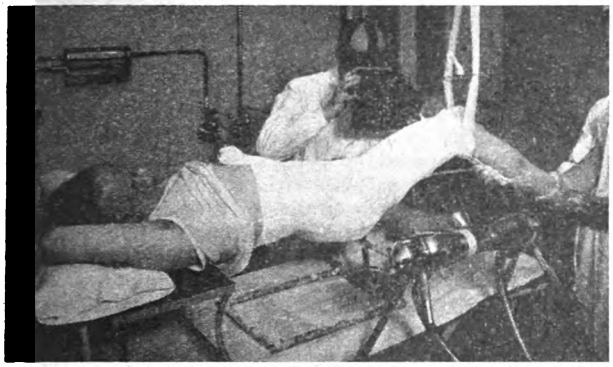

Fig. 5—Radioscopy when the plaster is half finished. In cases not completely reduced at the outset radioscopic examination enables the surgeon to decide what movements will now achieve reduction.

reduction, even if the patient is not anæsthetised, because he feels rested and eased, and relaxes better. As soon as the plaster hardens, the bandage supporting the knee is cut off level with the plaster, and the gaps left by it are stopped with liquid plaster (figs. 6 and 7).

We follow the ruling of Zupinger that the inferior fractured segment should be directed towards the superior segment. In general, the higher the fracture, the greater must be the abduction and flexion of the hip. If the fracture is in the lower third, the distal fragment is drawn backwards by the gastrocnemius; and the angle of the splint, which in such cases must be made more acute, presses the displaced segment into good alignment (fig. 8).

When the upper fragment is drawn inwards and forwards by the adductors it must be brought into

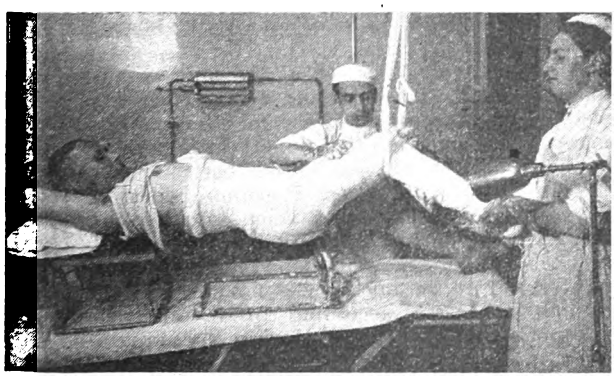

Fig. 6—Completing the plaster after perfect reduction.

apposition with the distal fragment; for this purpose a wide padded band of gauze is passed round the thigh and fixed to a ring on the wall as shown in figs. 9 and 10. The surgeon then brings the lower fragment into line, the position being controlled by screening.

In the Spanish civil war we found that, with exhausted wounded, manipulations were often quite unnecessary: if the limb was left suspended in semiflexion on a bent Cramer splint reduction followed almost spontaneously. In plaster-bandaging for transport, the nearer we got to applying the final plaster the better. At the beginning of the civil war various splints were used, the Thomas splint among them: it was so often misused that we came to call it "one more weapon against man." Even when it was well applied, immobilisation was altogether too imperfect. For short journeys we find it preferable to use the sound leg as a splint, or a simple Cramer splint conveniently bent. In base hospitals in peacetime we have used our method of plastering on open and closed fractures, following up the patients and getting good results in all.

ANÆSTHESIA

Fractures in the second phase with overriding must be reduced with the patient anæsthetised. If an operation has to be done, the fracture should be reduced and the plaster completed while the patient is still under the anæsthetic. Patients in the first and third phase do not as a rule need anæsthesia. When displacement is slight, with patients in the pre-exhaustion phase a local injection of 2% 'Novocaine' into the sound tissue suffices. Morphine in massive doses should be avoided because it masks symptoms. Though we have rarely used 'Evipan,' it has always given good results, and perhaps should be used more often. We have sometimes had recourse to general anæsthesia with ether. We are not in the habit of using root block because it reduces the blood-pressure and hence reinforces shock.

RECOVERY

Repair of the fracture begins with the formation of a fibrous periosteal cuff; and this precedes both the formation of callus and the walling-off of infection by the tissue barrier. If the wound is not infected, organised fibrous tissue can be found after about 10 days, and treatment to restore function can then begin. The fibrous cuff guards the fracture against sudden contractions of the strong thigh muscles, which might otherwise displace the bony fragments. Thus open fractures require absolute rest for a minimum of 10 days; and if infection is present, rest must continue until it has cleared.

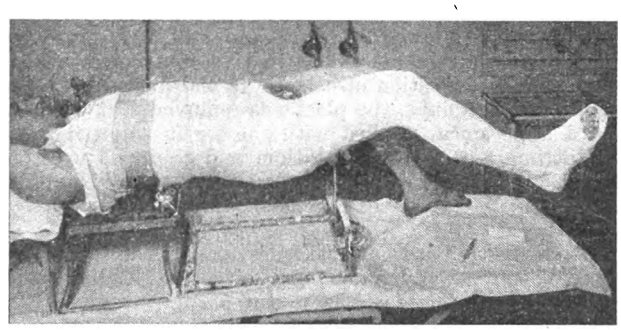

Fig. 7—The finished plaster.

Some advise that the sound parts of the body shall be moved freely so as to increase circulation through the limb; but this is very imprudent in the early days, because the limb cannot be kept entirely at rest if the body is moving. It seems to us advisable to allow movements of the other parts of the body only when the wound is not infected, and even then rest should be complete during the first few days. Nor is it advisable to take off the first plaster before the infection is overcome, and often it is better to wait until the wound is healed.

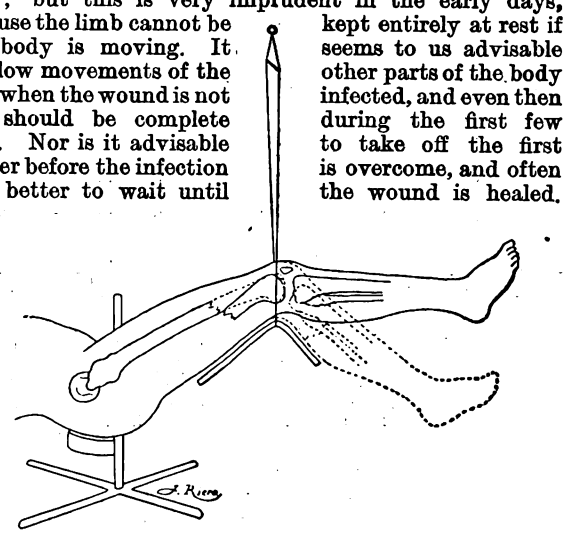

Fig. 8—Correcting posterior displacement of the distal fragment.

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In a few cases abscesses develop; when this happens the plaster must be split so that they can be opened, but these cases are rare, usually developing in patients who have been neglected for several days at the start.

When the patient has gone 10–20 days without fever, and his clinical state suggests that the infection is cured, he is encouraged to contract his muscles inside the

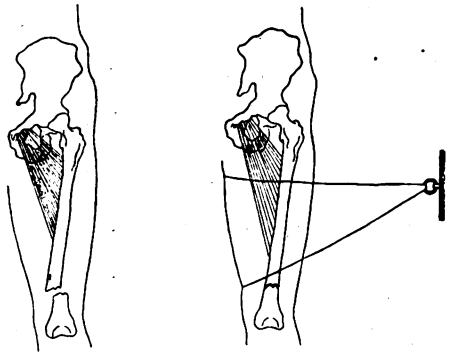

Fig. 9—Bandage to correct adduction of the upper fragment.

plaster and is allowed to get up and walk with crutches. The body movements induce active hyperæmia which favours the deposition of calcium in the fracture. After another 10–20 days, the plaster is removed and replaced by a large spica, applied with the leg in slight flexion, abduction, and external rotation, and equipped with an ambulatory stirrup. This ambulatory spica is put on with the patient in an extension apparatus and under anæsthesia.

There are no hard and fast rules about when to remove the plaster. Radiograms are often misleading and generally induce us to keep the plaster on too long. We think it is not a bad idea to give more importance, generally speaking, to the soft parts than to the fracture; good recovery in the soft parts is a preliminary to good repair of the bony parts. In closed fractures and open fractures which are not infected, solid callus can be found after 6 weeks. With mild infections the time is only a little longer. Thus the period of immobilisation varies between 8 and 16 weeks; and in closed and aseptic fractures 5–10 weeks may be sufficient. In fractures associated with long infective processes 18–20 weeks may be necessary.

CAUSES OF FRACTURE OF FEMUR IN 314 CASES

Wound	Upper third	Middle third	Lower third	Internal condyle	External condyle	Not stated	Total	Operation	No operation
Bullet	66	76	67	1	2	2	214*	116	98
Shrapnel ..	17	23	39	3	1	1	84	84	..
Accident, open	1	1	3	.	..	..	5	5	..
Blow from a stone, open	..	1	..	..	..	..	1	1	..
Accident, closed	1	3	6	..	..	..	10	..	10
Totals ..	85	104	115	4	3	3	314	206	108

* The preponderance of bullet wounds over shrapnel wounds is explained by two facts: shrapnel is often used against defensive positions, where the defenders expose more the upper part of the body; and shrapnel causing fracture of the femur often causes other wounds which are mortal, with the result that these cases do not reach the surgical services.

DISCUSSION OF RESULTS

No exact figures can be given, because we were working under conditions which made it difficult to collect statistics; and for the same reason it is impossible to compare our results with those of other workers using different methods.

At present we have records of 314 femur fractures treated by this method. We lost perhaps 80-odd records, which would have brought the series up to about 400. The causes, in the records we have, are set out in the table. Of the 314 fractures treated by our method, 298 were war injuries.

The gravely ill patient with a fractured femur who lives until his leg has been plastered in flexion is usually saved. Patients may die before or after surgical intervention, but, once the plaster is on, their general state improves as rapidly as that of an exsanguinated patient given a blood-transfusion. Several patients died a few minutes after being brought to our unit, before we could combat the shock, much less reduce the fracture and put on the plaster. Unfortunately we have no records of the numbers who died in this way. The 314 cases discussed here were all treated; 10 of them (3·1% of the whole group) died before the plaster could be applied.

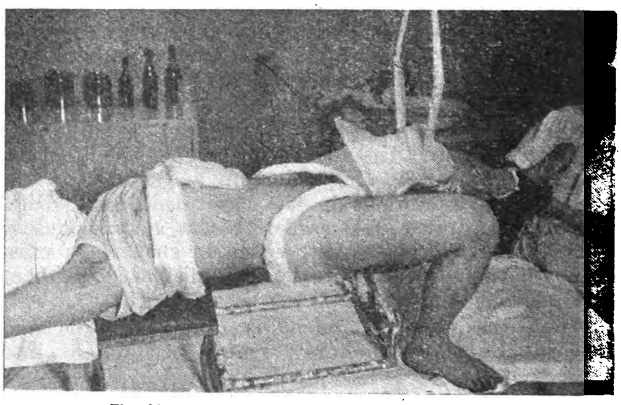

Fig. 10—Bandage to correct adduction in use.

All the wounded arrived at the unit exhausted after long hours of transport under bad conditions; they were shocked, almost pulseless, and often acutely anæmic; many had wounds in other important organs. After the application of the plaster, all felt better almost at once. In one case, with severe infection persisting several days, the plaster had to be taken off; Kirschner treatment was given immediately, but the patient died of septicæmia. One man developed large bedsores, and the plaster had to be taken off; he was treated by continuous extension according to Kirschner's method. In another patient the leg had to be amputated after a few days. A further patient was sent to another unit after plastering, and we were told that he developed gas-gangrene.

All the other patients generally did well—not only those whom we treated throughout but also those sent to other surgical stations whom we managed to follow up.

SUMMARY

A method of plastering open fractures of the femur with the limb in semiflexion is described.

The three fundamental rules for the treatment of open fractures—reduction, immobilisation, and control of infection—are met by this method.

Dr. Douglas Guthrie is delivering a series of lectures on the History of Medicine in the physiology department of Edinburgh University at 5 P.M. on each Monday between April 22 and June 24.

Lieut.-Colonel A. C. R. Sharp has taken the place of Major S. J. M. Goulston as medical representative on the Australian Army staff in London, whose address is 23, Sloane Gardens, S.W.1.

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MECHANICAL EXCITABILITY OF REGENERATING NERVE-FIBRES *

J. KONORSKI L. LUBINSKA

From the Physiological Laboratory, Nencki Institute for Experimental Biology, Poland

IN studying regenerating nerves one is struck by their extreme sensitivity to all sorts of mechanical stimuli. The slightest touch to the regenerating part of the nerve evokes reflex reactions in the animal, whereas much harder blows applied to the undegenerated part of the nerve, above the scar, produce no such effect.

Quantitative analysis of this phenomenon was undertaken in white rats, rabbits, and cats. Nerves were crushed, aseptically, and allowed to regenerate for periods ranging from 10 to 36 days. The length of regenerated fibres was ascertained by a method similar to that described by Young and Medawar (1940), and the rate of growth was determined. As the rate of regeneration is uniform, the exact age of regenerated fibres at any given distance from their end may then easily be calculated. The length of regenerated nerve can thus be regarded as the scale of age, having its zero at the end of fibres and increasing values towards the site of the lesion.

The graded mechanical stimuli were produced with a light hammer falling on the nerve from different heights, the weight of the hammer being modifiable at will. Such stimuli can be applied at exactly determined points of the nerve. They do not damage it and give repeatedly similar results, provided the nerve is maintained in proper conditions of temperature and moisture.

Systematic investigation of thresholds along the regenerating nerves shows enormous differences in mechanical excitability between the undegenerated part of the nerve and the tips of growing fibres.

TABLE I—MECHANICAL EXCITABILITY OF REGENERATING NERVE-FIBRES IN A CAT

Radial nerve				Peroneal nerve			
Distance from end (mm.)	Age (days)	Threshold— in multiples	Threshold— in ergs	Distance from end (mm.)	Age (days)	Threshold— in multiples	Threshold— in ergs
18	4	0·5	6	17	4	0·5	6
22	5	0·5	6	24	6	0·5	6
30	6	0·5	6	45	11	0·5	6
46	9	0·5	6	63	16	1·0	20
65	13·5	1·5	63	68	17	1·0	20
75	15·5	2·0	200	78	19·5	2·0	200
82	17	2·0	200	80 (on scar)	..	2·0	200
97*	..	2·5	630				
102†	..	2·5	630				

* 5 mm. above scar † 10 mm. above scar

Since our hammer was not delicate enough to furnish very accurate determinations, and we did not want to prolong the trials unnecessarily, it was found convenient to use geometrically increasing stimuli and to express the results in multiples of the unit chosen. The differences in mechanical excitability of different levels of regenerating nerve were so great that this method proved satisfactory.

The youngest part of a regenerated nerve is excited by blows of a few ergs, whereas the undegenerated part, like the normal control nerves, requires some hundreds or thousands of ergs to start the reaction. In the regenerated segment the mechanical excitability varies along the nerve, decreasing towards the older portions of the fibres.

Mechanical excitability as a function of age of regenerated nerve was investigated in nerves crushed at various times before the experiment and at different levels of one and the same nerve.

RESULTS

The results obtained are represented in the following protocols.

CAT 11.—Twenty-two days after aseptic crushing of peroneal and radial nerves. Peroneal: length of regenerated sensory fibres 80 mm.; rate of regeneration 4 mm. a day. Radial: length of regenerated sensory fibres 92 mm.; rate of regeneration 4·8 mm. a day. Latent periods: three days. (Table I.)

TABLE II—MECHANICAL EXCITABILITY OF REGENERATING NERVE-FIBRES IN A RABBIT

Right tibial nerve				Left tibial nerve			
Distance from end (mm.)	Age (days)	Threshold— in multiples	Threshold— in ergs	Distance from end (mm.)	Age (days)	Threshold— in multiples	Threshold— in ergs
8	2	0·5	6	8	2	0·5	6
17	5	0·5	6	17	5	0·5	6
55	16	1·5	63	23	6·5	0·5	6
66	19	2·5	630	37*	..	3·0	2000
83*	..	3·0	2000				

* Above scar

RABBIT 162.—Right tibial nerve crushed at middle of thigh; twelve days later left tibial crushed at same level. Twenty-three days after the first operation mechanical excitability was measured. Length of regenerated sensory fibres in the right tibial nerve 76 mm.; in the left, 27 mm. Rate of regeneration about 3·5 mm. a day. (Table II.)

COMMENTS

As shown by tables I and II, within the first fourteen days the fibres are extremely sensitive to mechanical stimulation. After about two weeks this sensitivity begins to drop both in cats and in rabbits. Then a rapid decrease of mechanical excitability takes place, and after about twenty days the threshold approaches the normal. In rabbits the equalisation of thresholds appears later than in cats. It must be mentioned that often the increased excitability is observed up to a few mm. above the scar. This is probably related to the retrograde degeneration in the terminal part of the central stump.

The present work could not be completed by histological examination of regenerating fibres at different levels, but the results obtained may be compared with the histological data of other workers. Holmes and Young (1942) found the beginning of myelination after about fifteen days—i.e., at the time when the first increase of threshold of mechanical stimulation was observed in our experiments. According to Gutmann and Sanders (1943) the full histological development of fibres regenerating after crushing of the nerve is only achieved after 250–300 days, but the morphological conditions enabling the mechanical threshold to return to normal are apparently attained much sooner.

It must be mentioned that with electrical stimulation, as will be shown in another paper, it is the youngest part of the fibre which exhibits the highest thresholds, and they sink progressively with age.

These two facts—the enormous difference in thresholds of mechanical excitation between normal and freshly regenerated nerve-fibres and the inverse behaviour of the latter towards electrical and mechanical stimulation—are of more than theoretical interest. They offer, in our opinion, practical possibilities in the diagnosis of nerve regeneration.

Increased mechanical excitability of freshly regenerated nerve-fibres underlies Tinel's sign. The restricted clinical

* The experiments reported here were performed in the physiological laboratory of V.I.E.M. in Sukhum, U.S.S.R., where the authors found hospitality during the war.

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applicability of this test and the scepticism of many neurosurgeons about its value are probably due to the fact that anatomical conditions often interfere with its elicitation.

In cases where it is desired to ascertain the beginning of regeneration before function has returned, direct exploration of the nerve and its mechanical stimulation by light touches with a glass rod might yield valuable information about the presence of regeneration and the distance to which it has progressed. Such a method may be more useful than electrical stimulation. The increase of thresholds for electrical stimuli in freshly regenerated fibres requires the application of strong stimuli, almost unavoidably leading to an escape of current through the neighbouring tissues and along the nerve towards the parts with lower thresholds. Localisation of the point of impact of the stimulus is very difficult in these circumstances. With mechanical stimulation, on the contrary, the point reached by regenerating fibres may be determined exactly, and the method does not require any precautions except keeping the nerve wet and warm and avoiding the action of local anæsthetics.

SUMMARY

Freshly regenerated nerve-fibres exhibit a greatly increased sensitivity to mechanical stimulation. The thresholds of excitation of regenerated sensory fibres in mammals are a few ergs, compared with some hundreds or thousands of ergs in normal nerves. With electrical stimulation the opposite relations appear, the highest thresholds being observed in the youngest parts of the fibre, and the lowest in the normal part.

The mechanical excitability falls progressively with the ageing of regenerated fibres.

The increased mechanical excitability of freshly regenerated fibres can usefully be applied to the diagnosis of nerve regeneration.

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VALUE OF TINEL'S SIGN

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A TINGLING sensation referred distally, produced by tapping over the course of a nerve, has been thought to indicate the regeneration of that nerve. This phenomenon was first described fully by Tinel (1915), who called it "le signe de fourmillement." The sign was at first highly esteemed as proof of regeneration. Babcock's *Textbook of Surgery* (1935) says: "Deep pressure tingling precedes the return of pain sensation, motor power, and tactile sense and usually indicates that they will follow, at least in some degree." Later, however, the sign fell into disrepute. Coleman (1944) states: "Time and again, patients with Tinel's phenomenon . . . were found at operation to have separated bulbous nerve-ends without the slightest possibility of regeneration." Pollock and Davis (1933) failed to elicit it in 7 of 50 recovering nerves; also it was "entirely absent" in only 7 of 50 complete lesions. Seddon (1943) says that the sign is unreliable as evidence of regeneration. The present tendency seems to be to neglect it entirely. In many hundreds of cases of nerve injury, we have never seen one mention of it in the notes of our colleagues.

INVESTIGATION

To estimate the clinical value of the sign we have noted whether or not it was present in 93 lesions of peripheral nerves seen at a peripheral nerve injuries centre in the Middle East. An analysis of these observations is given in table I. The difference between a positive sign and an advancing sign is not emphasised. A positive sign was often present near the periphery of the limb when the case was first seen.

TABLE I—TINEL'S SIGN IN PERIPHERAL NERVE INJURIES

—	Sign positive	Sign advancing	Sign negative	Total no. of lesions
Regeneration taking place	37	11	8	45
No regeneration during period of observation ..	6	3	6	12
After nerve suture ..	11	11	3	14
Nerve macroscopically normal at operation ..	6	1	1	7
Gross scarring of nerve at operation	1	0	0	1
Nerve completely divided	0	0	7	7
Previous positive sign has become negative ..	..	..	7	7
Total	61	26	32	93

The figures in the second column are included in the first column.

The criterion of regeneration was the observation of voluntary power in a muscle which had previously shown none. A mere increase in voluntary power in a muscle already innervated was not counted, because it was thought that subjective factors in estimating power would be too prominent. The response of a muscle to faradism is less useful as an early sign of recovery, since it nearly always returns after obvious voluntary power. Although Marble et al. (1942) considered recovery of sensation the most reliable sign of regeneration, we could not use this criterion, because we could not keep the cases long enough to see much change in sensation and we had no camera to record the area of sensory loss. The same difficulties apply to the sweat test.

In most cases of regeneration evidence of motor recovery and a positive Tinel's sign were present together within the period that one would normally allow to elapse before contemplating exploration, having regard to the rate of regeneration and the distance below the lesion at which the muscular branches are given off. However, this was not always so: table II gives details of 5 cases in which operation was withheld solely because of a positive sign; this attitude was later justified by the appearance of new muscular innervation.

TABLE II—RESULTS IN 5 CASES IN WHICH OPERATION WAS WITHHELD BECAUSE TINEL'S SIGN WAS PRESENT

Nerve	Level	First muscle innervated	Days after wounding when first muscular innervation noted
Ulnar	Mid-arm	Fl. carpi ulnar.	112
Ulnar	1 in. above epicondyle	Fl. carpi ulnar. and fl. digit. prof.	98
Peroneal	Multiple wounds of thigh and knee	Tibialis ant.	232
Ulnar	1½ in. below elbow	Fl. digit. prof.	148
Ulnar	Elbow	Fl. carpi ulnar. and fl. digit. prof.	104

The last 3 cases were followed to a stage of some innervation of all muscles.

Further elucidation is necessary in the 6 cases recorded as not showing regeneration during the period of observation (table I). The 3 cases with an advancing sign were a lesion of the ulnar at the upper third of the arm followed for 260 days, a lesion of the radial 4 in. above the elbow followed for 187 days, and a lesion of the ulnar at the

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lower third of the arm followed for 187 days. The other cases with a positive sign were seen 124, 150, and 215 days after injury. The last had a peroneal palsy following dislocation of the knee; from the nature of the injury a severe contusion of the nerve was considered to be the likeliest lesion; he was discharged to duty after 3 months, wearing a foot-drop appliance and then had a negative sign; when seen 4 months later he had a strongly positive sign but no evidence of motor regeneration. It is important to know the ultimate state of this group and regretted that we have been unable to follow them up. This group particularly leaves a large gap in our knowledge of the value of this sign.

It can be seen from table I that Tinel's sign may remain negative while recovery is taking place; a negative sign following suture does not necessarily mean that the operation has been unsuccessful.

Of the 7 cases in which a previously positive sign became negative, as always happens eventually, it was noted that in 5 the change took place while many of the muscles were still not innervated, or while all the muscles had some innervation. In 1 case, a partial lesion of the peroneal treated by resection of lateral neuroma and suture, Tinel's sign passed off 4½ months after operation; at that time there was no evidence of reinnervation; the patient was discharged wearing a foot-drop appliance; when next seen 5 months later he had good voluntary power in all muscles. In the seventh case the sign passed off 30 days after exploration of an ulnar nerve lesion 2 in. above the wrist; operation was done because of the absence of motor recovery 183 days after injury. The nerve was found to be bound down by scar tissue, and two small pieces of metal penetrating about a third of its substance were removed. When Tinel's sign became negative, there was still no evidence of muscular innervation. The length of time between the day of injury and the positive sign becoming negative varied between 84 and 206 days; in these 2 cases complete motor recovery took place. In 7 cases submitted to operation because of an absent sign and absence of motor innervation the nerves were found to be completely divided.

In 3 cases in which the nerve was macroscopically normal or nearly normal at operation Tinel's sign was the only indication that it was intact. In 2 cases the nerve was found to be intact at the time of wounding; they always showed positive signs; in one, evidence of extension of the toes was seen 161 days after injury; in the other, a case of compound fracture into the elbow-joint with ulnar paralysis, there was no evidence of innervation after 133 days.

CONCLUSIONS

The value of the sign is perhaps made clearer by putting these results as follows:

An advancing sign was never found with a nerve showing anatomical division.

A positive sign was never found with a nerve showing anatomical division.

An advancing sign was observed for 260 days without any motor signs of regeneration.

A positive sign was found with no sign of regeneration for at least 220 days; it was associated with a nerve showing macroscopical continuity.

A negative sign may be found with regeneration proceeding satisfactorily in a nerve the gross anatomy of which is normal and which responds to direct faradism. But when a sign is negative and the case is not seen within 100 days of the injury, there is a possibility that a previously positive sign has passed off.

From these observations, we have drawn the following principles for the management of peripheral nerve lesions:

We do not explore in the presence of an advancing Tinel's sign.

We do not explore in the presence of a positive Tinel's sign which is easily elicited at a distance below the site of the lesion. (This rule is not yet well established; 5 of the 61 cases on which it is based have not been followed up owing to war conditions.)

A negative Tinel's sign has no value; recovery may be proceeding satisfactorily, or it may not.

COMMENTS

A most important factor has not been considered, because we have been unable to follow up the cases sufficiently: we do not know the quantity and quality of function which was eventually obtained in those cases which recovered without suturing, and therefore we cannot compare it with the results of excision of scar tissue and resuturing. It must be added that the presence of Tinel's sign gives no evidence of the number of axons growing down the nerve. It is possible that exploratory operation should be done in every case; but results would have to be very good to compete with those obtained by leaving the nerve alone.

We cannot say when the sign usually appears, because in the majority it was already positive at our first examination, for we did not receive the cases early.

The presence of Tinel's sign is undoubtedly due to the state of hyperexcitability which accompanies regeneration of nerve; this state, below the lesion, was first shown by Trotter and Davies (1913).

The sign is a rough clinical guide. It depends on all the subjective factors which are always present when reliance has to be placed on the word of a patient. It also depends to a certain extent on how hard the limb is tapped; and the presence of scarring may connect two neighbouring nerves so that the impulse on one is transmitted to the other; since the distal reference is rarely confined to the territory of the nerve tapped, this transmission of stimulus may not readily be found out. Observers often differed by 2 cm. over the point reached by a positive sign; all our cases were observed by each of us independently; most of them were observed by the patient, who often finds the sign out for himself, however his doctor may value it.

It is clear that the observations in this paper do not cover a sufficient length of time on each lesion to draw any final conclusions, but they may reawaken interest in this sign. The least that can be said of it is that it is of value.

SUMMARY

The state of Tinel's sign in peripheral nerve lesions is recorded in relation to regeneration and the state of the nerve found at operation.

An attempt is made to evaluate the sign; conclusions are tentatively drawn on the management of peripheral nerve lesions, making use of the sign. A negative sign has no value. A positive sign which is advancing or can be elicited well below the lesion contra-indicates exploration.

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REFRESHER COURSE IN PARIS.—A three-day course on recent advances in medicine is to be held under the direction of Prof. Pasteur Vallery-Radot at the Hôpital Broussais, beginning on May 17. Further information may be obtained from Dr. Jean Hamburger, 29, Boulevard de Courcelles, Paris, 8.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.—A meeting will be held at Manchester on May 16–18. The time will be devoted mainly to papers and to study of the cotton industry. The hon. secretary is Dr. P. Pringle, Standard Telephones & Cables, Ltd., New Southgate, London, N.11.

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Reviews of Books

Peripheral Nerve Injuries

Principles of Diagnosis. WEBB HAYMAKER, major M.C., A.U.S., neuropathologist, Army Institute of Pathology, Washington, D.C.; BARNES WOODHALL, lieut.-colonel M.C., A.U.S., chief of the Neurosurgical Section, Walter Reed General Hospital, Washington, D.C. London: Saunders. Pp. 227. 22*s.* 6*d.*

IN the preface the authors claim that "the text reiterates not only what is well-established, but gives new information that inevitably accrues from war." Certainly much of the information given is already available in Britain through the Medical Research Council's guide to the diagnosis of peripheral nerve injuries, but the material is presented in this book in a more elaborate way, with detailed descriptions of lesions of individual nerves. Orderly, clear, and in the main well illustrated, it is avowedly a manual on the principles of diagnosis; but it is difficult to discuss diagnosis intelligibly without some reference to pathology, and here the book fails. A few pages on pathological changes in peripheral nerves and their end-organs would have put the rest of the work into correct perspective and made many of the diagnostic methods easier to understand. For example, the fundamental distinction between degenerative and non-degenerative nerve lesions is not made clear; and though the authors mention that in "compression syndrome" there is the "paradoxical electrical reaction of Erb," they offer no explanation. Moreover the syndrome of the transient lesion (neurapraxia) is confused with the purely motor degenerative lesion, in both of which the electrical reactions are all-important in diagnosis and prognosis. Indeed, the two pages on electrical examination are perhaps the weakest part of the book; but there are other important omissions. The use of diagnostic nerve-blocks is not described, and the method of recording motor power is not precise, no indication being given of the exact significance of values designated as +, ++, or +++. Photographic records of sensory changes are always to be preferred, but here the value of the pictures is decreased by the variable markings used for touch and pain sensibility. Diagnosis of nerve injuries in the presence of complications, such as joint stiffness or contracture of muscles, and analysis of various types of partial lesions are not considered. The book is of course not intended to be a complete account of the subject, but a convenient guide to the commoner nerve injuries; and in this it achieves a somewhat ponderous success.

The Midwife's Text-book

(2nd ed.) R. W. JOHNSTONE, C.B.E., M.D. Edin., F.R.C.S.E., F.R.C.O.G., professor of midwifery and diseases of women, University of Edinburgh; chairman, Central Midwives Board for Scotland. London: Adam & Charles Black. Pp. 360. 18*s.*

WITH his vast experience not only of clinical midwifery but also of the exact nature of a midwife's duties, Professor Johnstone has produced for her a textbook which is readable, well illustrated, and absolutely clear. He neither insults her by assuming she lacks the power to reason nor does he assume her knowledge of scientific medicine to be greater than it is: the balance has been well struck. This second edition appears within two years of the first.

Chronic Addiction and Chronic Alcoholism

Editor: E. M. JELLINEK. New Haven: Yale University Press. London: Oxford University Press. Pp. 336. 26*s.* 6*d.*

THE Research Council on Problems of Alcohol obtained the support of the Carnegie Corporation for a critical analysis of the formidable published work on the effects of alcohol. The present volume, which is largely clinical, is the first of the three projected: the other two are to deal with physiological and psychological effects, and the incidence of addiction. The chief contributors to this volume are Professor Bowman and Dr. Jellinek, who have prepared an exhaustive, rather than rigorous, survey of what has been written about alcoholic mental disorders and the causes and treatment of addiction, and Professor Jolliffe who, with collaborators, reviews vitamin deficiencies in chronic alcoholism, the alcoholic encephalopathies, and cirrhosis of the liver. There is a short chapter also on Marchiafava's disease. The contributors to this useful book, gentle though they are in their criticisms, underline the waste of effort and the careless observation that has often usurped the place of research in the field of alcoholic diseases: by clearing the ground they show not only what territory is properly mapped but the gaps which most need exploration.

Children's Diet

Based on the Conclusions of Modern Nutritional Research. M. BIRCHER-BENNER, M.D., with the collaboration of Dr. M. E. BIRCHER. Translated by Reginald Snell. Rochford: C. W. Daniel. Pp. 64. 3*s.* 6*d.*

Dr. Bircher-Benner, who died in 1939, was a graduate of Zürich and for most of his life was an enthusiastic advocate of the value of raw foods in the diets of both adults and children. This booklet was expanded from an address to the Pædagogic Association of Zürich and has been translated by the senior German master at an English vegetarian school. The author had many sound things to say about the importance of a balanced diet, of vitamins, of salads, and so on; but the book contains many statements which are at variance with current ideas—for example that

"The excessive provision of foods rich in protein—of meat, eggs or cheese—of too much fat, of carbohydrates, especially in the form of sugar, in the long run damages the constitution of the growing human being through a dislocation of the acid-alkaline balance in the direction of too much acidity. Under the influence of this acidosis there arise, as Katase tells us: (1) through increased growth in length of the bones the long, thin, narrow chested type of man, the so-called asthenic constitution; (2) weak muscular system; (3) pigeon chest; (4) 'pear-shaped' heart; (5) the undeveloped or infantile uterus; and (6) a susceptibility to juvenile diseases."

If we could apply the knowledge of dietetics gained in the last hundred years, dietary reformers who approach the subject from a fixed angle would find much of their apprehension about health relieved.

Refraction of the Eye

(2nd ed.) ALFRED COWAN, M.D., professor of ophthalmology, University of Pennsylvania. London: Henry Kimpton. Pp. 278. 24*s.*

Professor Cowan gives a lucid description of the principles of refraction of light, and applies this knowledge to an explanation of the eye as a piece of optical apparatus. The theory and practice of retinoscopy by various means is clearly set out, together with the diagnosis and treatment of ametropia. He has done his best to make a difficult subject palatable to the medical mind, though, in a book about spectacles, a chapter on headaches would have been welcome. The eye, moreover, besides being a fine piece of optical engineering, is a part of the human body, and subject to many of its ills, so it would be worth mentioning that poor general muscular tone means weak accommodation, and that treatment in such cases is general, not local. This useful book, however, will commend itself to those about to take the higher ophthalmic examinations.

Rebel Without a Cause

ROBERT M. LINDNER, PH.D., U.S. P.H. Service (R); psychologist U.S. Penitentiary, Lewisburg, Pa. With an introduction by SHELDON GLUECK and ELEANOR T. GLUECK. London: Research Books (distributed by Heinemann). Pp. 239. 21*s.*

THE treatment of forms of psychopathic personality which lead to criminal behaviour is an urgent problem for society. Dr. Lindner has worked out a telescoped psychoanalytic technique which harks back to the earliest methods of Breuer and Freud. It evidently penetrated the shell of sullen bitterness in the recidivist, whose hypno-analysis is described, and went a long way towards reclaiming him from his criminal propensities. The work contains verbatim accounts of what he and the analyst said during the 46 sessions of treatment, and is therefore an illuminating document for non-analysts as well as a striking contribution to the psychopathology of crime.

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THE LANCET

LONDON: SATURDAY, APRIL 27, 1946

The Debates Open

THE translation of the National Health Service Bill into an accomplished service will have six main phases, in each of which the medical profession has its changing part to play. To play these parts successfully it will need to foresee and utilise the opportunities each phase will offer.

The first, which began when the Bill was published, is now ending. It was a phase of scrutiny, of assessment, in which the Bill has been widely subjected to comment and criticism. At well-attended meetings up and down the country doctors have discussed the more controversial points raised, while the spokesmen, official and unofficial, of all the several interests have had their varied say. Statements made by doctors, nurses, voluntary hospitals, and local authorities have in turn commanded attention. The press, by devoting a liberal amount of its restricted space to each fresh development, has reflected the importance of the new proposals and the sustained public interest in them. The way has thus been made ready for the phase of public debate, which, while displaying the advantages the Bill may offer, will yet reveal its shortcomings, and will prepare the scene for the third and important phase of amendment—the committee stage of the Bill. Fourth will come the phase of enactment; but the transformation of the Bill into an Act will be only a legislative beginning. All the many regulations which the Act will empower or require the Minister to make will need to be drafted and placed before Parliament. We may hope and expect that in their drafting he will seek the guidance of the medical profession and of the other groups concerned in the future service. The Bill leaves so much to be determined in this fifth phase that the whole texture of the service, and its eventual practicability, may well depend upon the shape taken by the regulations then devised—regulations which, once presented to Parliament, will, except in the unlikely event of a successful prayer against them, have the force of law. Only when these regulations are known will the shape of things to come be finally revealed; and it is only then that the sixth phase will open, in which the Minister will have to recruit the doctors and others whose willing help he will need to establish the new service and ensure its success.

But we are jumping months ahead, incalculable months, full of problems whose nature and extent cannot be predicted. So it might be well to return to the tasks of the coming weeks. It was expected that the debate in the House of Commons on the second reading of the Bill would have taken place before now; but the Government have listened to representations and by postponing it until after the Easter recess have enabled members to study the proposals more closely and consult with their constituents. Three days next week have been allotted to the second reading; and it so happens that on these same three days two medical meetings will also be discussing the Bill—the Panel Conference on Tuesday, and the Special Representative Meeting of the British Medical Association on Wednesday and Thursday. Meanwhile there has already been a preliminary debate in the House of Lords (see p. 632), where Lord MORAN, in a speech of constructive leadership, asked questions that will need answer. In the more comprehensive and more detailed debates in the Commons, and at Tavistock Square, other controversial issues will no doubt be demonstrated. In view, however, of the large majority which the Government enjoy, Parliament is unlikely to accept any changes that would amount to rejection of the Bill, and it will therefore be the principal—and urgent—function of these debates to indicate on just what points the proposals are susceptible to satisfactory amendment. At this juncture the profession can play its responsible part best by offering reasoned criticism and positive suggestions for the improvement of the Bill, rather than by indulging in general condemnation or threats of boycott. Although some extreme voices may be heard at the Representative Meeting, the majority of representatives will be aware that their task is to state as precisely as possible what changes in the Bill the medical profession would advise in the public interest. The profession's attitude towards the new service cannot be defined until at least the final form taken by the Act is known.

In the crucial weeks that lie ahead the informed opinion of the medical profession could, and should, materially assist Parliament in moulding the new service. We hope that the profession in conclave will tender advice in this spirit and that Parliament will not lightly dismiss this advice because of any supposed ex-parte bias. The MINISTER OF HEALTH has said that his object and that of the doctors is the same—the establishment of a health service that shall be second to none. Given the proper opportunities the profession can provide the expert assistance that will alone make this possible.

Control of Wound Infection

THE surgeon who has happened to miss the experience of war wounds or air-raid casualties is apt to think lightly of wound sepsis, for clinical infection of the deliberate wound is exceptional. In normal hospital practice the evil consequences of wound sepsis are seen most often in the outpatient casualty department, where infection of apparently trivial hand injuries has often led to much deformity and loss of function. Otherwise it is only in the fracture clinic or the burns unit that bacterial infection occurs with any frequency; and there serious sequelæ may be so rare that the surgeon regards them as unfortunate incidents for which he bears no responsibility.

In peace-time the surgeon relied on a combination of aseptic and antiseptic surgery to control wound infection, and it was the failure of this technique in the two world wars that encouraged investigation into the mode of infection of wounds and the channels by which infection spreads. That most war wounds are infected after the patient is admitted to hospital was suggested by the findings in the 1914–18 war and confirmed in the second world war by the new methods of bacterial identification which the bacterio-

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logists had evolved in the interim. A critical examination of dressing technique showed that there are many and various ways by which pyogenic bacteria can be transferred from an infected to a clean wound, and circumstantial evidence suggested that direct transference by fingers or forceps during the ward round is the greatest hazard. As a result a "no-touch" technique was introduced and the results have been most satisfactory, not only in the ward but also in dealing with minor injuries in the outpatient department. At the Accident Hospital, Birmingham, where a special unit was established by the Medical Research Council to study wound sepsis in industrial injuries, WILLIAMS and his colleagues [1] have effected a significant reduction in "added infection" by reorganising the lay-out and the ritual of the outpatient dressing station, and their example might well be copied in other outpatient departments. In the factory surgery, too, a modified no-touch technique has reduced the incidence of secondary infection.[2] The finding of hæmolytic streptococci in a wound is almost always an indication of added infection, and a useful criterion of a satisfactory dressing technique in the outpatient department would be a streptococcal infection rate of less than one per cent. WILLIAMS and CAPEL [3] are careful to point out that only about 1–5% of factory wounds become infected, and that while a high standard of dressing technique in the factory surgery will reduce the sepsis rate more benefit might be derived from efforts to reduce the incidence of factory accidents.

The surgeon has at last found an antiseptic that works. After the disappointing results with sulphonamides, used either locally or systemically, in the treatment of the larger wounds, it seemed almost too much to hope that penicillin would be the answer to the surgeon's prayer; but the encouraging results obtained in the later months of the war have been duplicated in civilian practice. Compound fractures and other lacerated wounds are now being sewn up within a few days of wounding, in the confident knowledge that healing by first intention will be the rule rather than the exception, provided penicillin is given systemically for 4–5 days. This early closure of an open wound reduces the risk of secondary infection to a minimum and restores the function of the limb much sooner than was previously possible. In small hand injuries, too, penicillin has proved of value in controlling secondary sepsis and preventing deformity and loss of function.[4]

The burn presents a different and much more difficult problem. The large abraded surface is particularly vulnerable to attack by pathogens in the air as well as on hands and fomites; some 10–15% of burns are already infected with hæmolytic streptococci before admission to hospital; completely occlusive dressings for wounds of the face, neck, and buttocks are difficult to maintain; frequent change of dressings provides an opportunity for added infection; and the local application of sulphonamides or penicillin will not eliminate all the pyogenic organisms. Thus, despite heroic efforts to prevent cross-infection in the burns wards at the Glasgow Royal Infirmary, COLEBROOK and his colleagues [5] could not reduce the secondary streptococcal infection rate below 30% for the greater part of the year. Among their conclusions were the desirability of establishing specially designed and properly staffed burns units and the need for dressing all burns in an atmosphere free from infected dust and pathogenic bacteria. A unit of this kind, sponsored by the Medical Research Council, has been set up at the Birmingham Accident Hospital. It consists of four 8-bedded wards (one each for men, women, and children, plus a spare ward), a plenary-treatment room where new admissions are dressed, a shock-room, a saline-bath room, a metabolic ward, and an air-conditioned dressing station consisting of three parts—an air-lock into which the bed is wheeled and in which the patient is prepared, a dressing-room proper, and an adjoining sterilising-room.[6] A special ventilation plant was installed to supply a forced draught of filtered, warmed, and moistened air into the dressing-room from the ceiling, circulation being helped by an exhaust fan opposite the door leading into the dressing-room. The value of this air-conditioned dressing station in preventing bacterial pollution of the air and in reducing secondary infection of burns is described by BOURDILLON and COLEBROOK in the paper concluded in this issue. When in operation, the plant gave equivalent air changes of 10–20 per hour, which with an interval of 5 minutes between each dressing was sufficient to maintain a very low bacterial content in the air. In the absence of forced ventilation, on the other hand, the dressing of a wound infected with *Staph. aureus* might so contaminate the air that it still contained 22 *Staph. aureus* per cubic foot 25 minutes after the dressing was finished and it took 37 minutes before aerial pollution of the dressing-room was reduced by half. Using an improved model of the slit sampler, BOURDILLON and COLEBROOK were able to demonstrate the sources of air-borne bacteria. Heavy showers of organisms were released by the cutting of bandages and movement of unoiled blankets; pyjamas and other woollen articles which could not be sterilised by laundering, and movement of the staff, were also common sources of aerial pollution.

When the occurrence of secondary infection with three easily identified organisms—*Strep. pyogenes*, *B. proteus*, and *Ps. pyocyanea*—was analysed, some remarkable figures emerged. Thus, in 801 dressings there was evidence of added infection with the hæmolytic streptococcus in only 16 instances; with *B. proteus* there were 16 added infections in 763 dressings, and with *Ps. pyocyanea* 8 added infections in 834 dressings. Secondary infection with these organisms was much more common in wounds which were difficult to cover (8·2%) than in burns which could be completely occluded (0·18%), and very few of the wounds that became infected did so as a result of being dressed after an infected wound. Thus the evidence indicated that most of the cross-infections occurred in the ward and not in the dressing-room. BOURDILLON and COLEBROOK do not claim that the excellent results were wholly attributable to the use

1. Gissane, W., Miles, A. A., Williams, R. E. O. *Brit. J. indust. Med.* 1944, 1, 90. Williams, R. E. O., Clayton-Cooper, B., Howat, T. W., Miles, A. A. *Brit. J. Surg.* 1945, 32, 425.
2. Clayton-Cooper, B., Williams, R. E. O. *Brit. J. indust. Med.* 1945, 2, 146.
3. Williams, R. E. O., Capel, E. H. *Ibid*, p. 217.
4. Florey, M. E., Williams, R. E. O. *Lancet*, 1944, i, 73.
5. Colebrook, L., Gibson, T., Todd, J. P., Clark, A. M., Brown, A., Anderson, A. B. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1944, no. 249.
6. *Nursing Times*, Jan. 6, 1945.

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of the air-conditioned dressing station. A strict no-touch technique and the standards of the operating-theatre were used throughout the dressings, the dressing-room floor was oiled, and penicillin cream was used on all burns. In view of the incrimination of dressings and blankets as prolific sources of air-borne bacteria, it would be interesting to know what results could be obtained by oiling these fabrics. Again, the recent experimental evidence of the value of occlusive pressure dressings in promoting healing and reducing bacterial infection [7] warrants fuller use of this method. And it remains to be decided whether burns should be congregated in special units or treated as ordinary surgical casualties.

Venereal Diseases and Compulsion

THE familiar weapon of compulsion is again being recommended for use in the age-old campaign against the venereal diseases. At the Royal Sanitary Institute on April 10 the case in its favour was put by Dr. J. GREENWOOD WILSON, medical officer of health for Cardiff, who appealed for an intensification of all present measures for the control of venereal diseases, with legislation to provide sanctions in the background when tact and persuasion failed. He recalled how in the control of some other infectious diseases, including scabies and tuberculosis, compulsive measures had provoked resentment at first, yet in the course of time compulsion was taken for granted and legal action was rarely required. It was often said that with venereal disease the case was different, because of the social stigma which attached to it, and that doctors would refuse to notify their patients. These factors might make for opposition in some quarters; but similar difficulties that had arisen in relation to other problems had not interfered with progressive legislation. Thus the stigma which formerly attached to tuberculosis was not allowed to hinder the operation of enlightened legislation for the benefit of the community. Regulation 33 B, in Dr. WILSON'S view, was a step in the right direction, but it had proved ineffective for the control of venereal diseases. More than 13,000 alleged contacts had been reported since 1942, but less than 30% of them were medically examined for venereal disease. There had been 82 prosecutions. Often the information given in the initial report was too scanty to enable the patient to be traced. There was no central register of contacts and many were lost in moving from one district to another. There was also an increasing wariness among likely candidates for notification, who therefore gave false names and details to their clients. Dr. WILSON summed up his view of the situation in this country as compounded of insufficient legislation, barely adequate medical services, and a half-hearted social service. In Sweden, on the other hand, notification and treatment had been compulsory since 1919. Names and addresses were not given unless treatment was discontinued, and marriage was forbidden until cure was certified. All treatment was free. In consequence, from 1919 to 1939 the incidence of gonorrhœa had been reduced to half, and syphilis to a tenth. Legislation was of course accompanied by adequate education and by medical, nursing, and social services of a high standard. In this country gonorrhœa had increased, and syphilis had only fallen to half of the 1919 figure. Dr. WILSON appealed for legislation to bring "new life to the dry bones" of the existing organisation of medical, nursing, and social services. With the introduction of the new health legislation, the M.O.H. would be the link between the collateral measures of medical and social services. Notification of venereal infections would be essential.

The opposition to compulsion was led by Miss DOROTHY MANCHEE, who pointed out that many intelligent people were unaware of, or indifferent to, the human factors underlying this great problem. The interests of the community could best be served by regarding sufferers from the venereal diseases as individuals, as in fact they were, and not as a class apart. Compulsion would act as a stumbling-block to those engaged in the control of venereal diseases. Compulsory notification would fail because the doctors would not comply with a regulation which struck at the root of the relationship of trust and confidence between doctor and patient. It had taken years to establish the confidence of the public and medical practitioners in the public clinics, and legislation for compulsion would at once destroy that confidence and drive patients to seek advice from those who were less competent or even from quacks. Compulsion to undergo treatment which might cause death or permanent injury was contrary to the fundamental principles of liberty and smacked of Hitlerite Germany. The remedy lay rather in the proper education of ordinary men and women, in the provision of better social services, and in improving the medical and nursing facilities, which fell short of the required standards in some parts of the country. Proper housing and additional domestic help were vital. Parents should be enabled to take their recreations together. Films, plays, and books should show a different outlook on life, and emphasis should be laid on the dignity of the housewife and of motherhood. Social workers in venereal diseases clinics could do much in rehabilitation, but there were too few of them.

Most speakers in the discussion agreed on the necessity for improved education and better social services; but on compulsion there was a sharp division of opinion. The case for compulsion received most support from medical officers of health, who appealed for a realistic outlook which would place the needs of the community before those of the individual. The present system had been tried and had failed; we should therefore strengthen our iron administrative hand, which, clothed in discreet velvet, would guide the waverers and the recalcitrant in the way they should go. It seemed that those in closest touch with the patient took the contrary view, maintaining that ordinary men and women were anxious to have necessary treatment and to coöperate. Contacts who were approached after one notification under regulation 33 B had shown no resentment—in fact most of them had not known that they were infected and promptly sought advice. It was feared that the threat of compulsion would do more harm than good. Colonel L. W. HARRISON, speaking as an administrator and clinician, thought that there was some justification for compulsion on parents in cases of infected children, but was strongly opposed to

7. Cameron, G. R., Allen, J. W., Coles, R. F. G., Rutland, J. P. *J. Path. Bact.* 1946, 58, 1.

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general compulsion. He could not admit the accuracy of the analogy between tuberculosis and the venereal diseases. Sufferers from the latter dreaded publicity above all things. In his view, private practitioners would not notify their cases. He questioned the accuracy of conclusions drawn from the situation in Sweden, where there had been a big war-time increase in venereal diseases although Sweden had been a neutral country. In Denmark, too, syphilis had increased very greatly, but conditions there had been affected by the Nazi occupation. In England the incidence of syphilis had fallen to less than a third from 1921 to 1939, and the rate for congenital syphilis during the same period had fallen from 2·0 to 0·2 per thousand live births. He doubted whether, in view of the efficacy of modern methods of treatment, defaulters spread much disease at the present time.

The crux of this controversy is whether compulsory notification and treatment will really produce results. On the need for powers to compel neglectful parents to bring their infected children for treatment there will be unanimity. But with public opinion in its present unenlightened state most doctors, and many patients, would resent a system of general notification under which public authorities would have power to insist on the disclosure of names and addresses, either at the time of notification or for any reason later. Resentment would mean non-compliance, and the legislation would then fail. For the present, perhaps, we cannot look for more than the anonymous notification of all diagnosed cases. Such a form of notification would be only of statistical value; but the statistics might be revealing, for it has never been possible to ascertain the true extent of the problem in this country. Regulation 33 B already provides for the notification of those who are alleged to have spread venereal diseases. Its purposes have been largely defeated by the necessity for two separate notifications before official action can be taken, and most of its successes have resulted from unofficial action taken after one notification. There is certainly a case for adjusting this regulation so that official pressure can be brought to bear on those few—usually the psychopathic, the mentally defective, or the dull and backward—who resist unofficial methods of approach. What of the patient who begins treatment and then refuses to continue—the irresponsible youth, for instance, who defaults as soon as his symptoms have abated? Presumably compulsion would not be carried beyond the stage of infectiousness. And who is to judge when the stage of infectiousness is past; and if there are to be fixed standards of cure who is to set these standards? Such matters must be faced even if public opinion can be led to accept the general principle of compulsion. Meanwhile much could be done to improve medical and nursing facilities; and in the background is the fundamental need for better education and social conditions. For their part, doctors and nurses must endeavour to remedy the neglect and dislike with which they have too often treated these patients, and to reject the moral judgments which are apt to cloud their outlook. A further plea may be entered for the allocation of funds for research in these diseases. Most official pronouncements seem to be based on the assumption that there are no gaps in our knowledge of the subject. Treatment is the word which is always stressed, but there are still serious deficiencies in our knowledge of the fundamental pathology of venereal diseases.

Bart's Commemoration

THIS year St. Bartholomew's Hospital, the only general hospital in the City of London, celebrates the 400th anniversary of its second foundation. The hospital already had over 400 years' work behind it when Henry VIII in 1546 took over its lands, rents, and perquisites, and it was only on the urgent petition of the mayor, commonalty, and citizens of London that the King was induced to restore them. At the commemoration celebrations to be held at the hospital on May 8 these episodes will be recalled in *The Awakening*, when Mr. Robert Morley will play the part of Henry VIII. The KING and QUEEN have signified their intention to be present, and afterwards there will be a service when it is hoped that Dr. Garfield Williams, dean of Manchester and a former student of the hospital, will give an address. Other functions to be held on the same day will include the celebration of the 150th anniversary of the foundation of the Abernethian Society, the centenary of the introduction of chloroform into the hospital, and the jubilee of the use of X rays in diagnosis. Further information may be had from the hon. secretary of the commemoration, St. Bartholomew's Hospital, London, E.C.1

The G.M.C.

THE case of Dr. Hennessy, outlined this week under Medicine and the Law, illustrates the disadvantages inherent in the present penal procedure of the General Medical Council. These disadvantages have long been evident to those chiefly concerned, and as the House of Commons was told last week (see p. 634) the council themselves are at present considering proposals for the reform of the Medical Acts of which they are the instrument. The three Medical Defence Societies, through their joint coördinating committee, and perhaps other professional bodies, will shortly be making recommendations on this subject to the council, and no doubt these will cover such matters as the power of the council to subpœna witnesses and hear evidence on oath, the opportunity of respondents to appeal to the courts, and the possible constitution of a disciplinary tribunal distinct from the committee of the council which undertakes the preliminary investigation of penal cases. The grave nature of the penalty which the council can inflict makes it necessary that they should have full facilities for ascertaining facts; and though their functions are professional their methods must command public approval.

Lieut.-Colonel S. P. JAMES, C.M.G., F.R.S., died on April 17. Since he retired from the I.M.S. in 1918 he had served as an adviser on tropical diseases to the Ministry of Health and the League of Nations. A former president of the Yellow Fever Commission of the Office International d'Hygiène Publique, he was also awarded the Darling prize in 1934 for his work on malaria.

Sir HAROLD STILES, emeritus regius professor of clinical surgery in the University of Edinburgh, died at Gullane on April 21 at the age of 83.

In the *Times* of April 20 the death of Dr. W. E. DANDY, professor of neurosurgery at Johns Hopkins University, is announced. His publications include descriptions of his pioneer work on benign tumours in the third and lateral ventricles of the brain. He was 60 years of age.

THE DENTISTS REGISTER for 1946 contains 15,422 names, of which 253 were added during 1945. This is the smallest increment since 1932. In all, 332 names were removed last year, 210 on evidence of death, while 63 were restored. Four names have been added to the foreign section, bringing the total to 178.

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Annotations

AFTER DISCHARGE FOR NEUROSIS

DURING the recent war the arrangements for preventing and handling neurosis were such as to reduce greatly the ill-effects that might have been anticipated from earlier experience. Nevertheless the aftermath of neurosis among Service personnel was still a ground for concern among those who saw the patients during the first two or three years of the war. In 1943 two reports appeared, by Ferguson [1] in Scotland and by Lewis in London,[2] which revealed a disturbing situation. The Ministry of Health decided on a follow-up study embracing a wider sample, and they entrusted it to Dr. E. Guttmann, of the Maudsley Hospital, whose findings have now been published.[3] In conjunction with an experienced psychiatric social worker, Miss Elsie Thomas, who did the field work, Guttmann made a thorough investigation into the readjustment in civil life of a sample of men who during the first quarter of 1943 were discharged from the Army on account of neurosis. The areas selected for study were Berkshire, Buckinghamshire, and Somerset (as examples of predominantly rural districts), Birmingham, Hull, and Leicester (as industrial cities of varying size), and also Lancashire, Essex, and Warwickshire. The visits to ascertain each man's subsequent condition were made, on the average, fifteen months after his discharge from the Army.

Three-quarters of the men, it was found, had required medical attention during the period since discharge, and nearly all had lost working time through sickness, the absence-rate being between 9% and 13% of the time at risk. The reduction of occupational efficiency in these men was striking. The proportion unemployed at the time of the inquiry was 6%, and 13% of the total sample had changed their job three or more times—a much less stable employment record than that of an average war-time factory population. Besides these occupational signs of their continuing neurosis, 10% showed evidence of serious domestic and social maladjustment. The importance of social influences in determining the degree of incapacity could be recognised: for example, those who returned to their previous employers did better than the others, whereas a personal history of neurotic ill-health apparently had no predictive value as regards readjustment. Guttmann and Thomas point out that the occupational and social incapacity of this group of men is not to be interpreted without regard to their pre-enlistment record, which showed that their adjustment to work and to the ordinary stresses of life was less satisfactory than in the rest of the population; the effect of changing social conditions moreover is so great that conclusions based on this group could not safely be applied to those discharged at other periods of the war or from other Services. For example, the group studied contained few men whose neurosis could be regarded as a battle casualty; a sample chosen at another stage of the war might have included many such men, and their subsequent history would probably have been different.

The outstanding conclusion from this study is that the social organisation for dealing with the problems of the neurotic ex-Service man is, in conjunction with an appropriate medical service, a powerful agency in determining and limiting the amount of incapacity, and that the critical period for readjustment is the first few months after discharge. Much in the detailed tables and comments is relevant to the whole problem of reablement.

1. Ferguson, T. Health and Industrial Efficiency. H.M. Stationery Office. 1943.
2. Lewis, A. J. A Study of the Social Effects of Neurosis. *Lancet*, 1943, i, 167.
3. Guttmann, E., Thomas, E. L. Readjustment in Civil Life of Soldiers discharged from the Army on account of Neurosis. *Rep. publ. Hlth med. Subj., Lond.* no. 93. H.M. Stationery Office. 1946.

Particularly valuable is the evidence which the report affords of how necessary a thorough survey is, and of the lines on which it must be undertaken. The common difficulty of all such surveys is the loss of a number of persons in the sample, who for one reason or another do not afford the necessary data; in Guttmann's inquiry, however, every person among the 382 included in the sample was traced and yielded information—an almost unprecedented achievement in a study of this type. The account in the text shows how much this was due to the method employed and to the tact and experience of the psychiatric social worker. A comparison of the results obtained by the field investigator using her expert training, with the data obtained by a postal inquiry, showed that the latter were less complete, less accurate, and less reliable. Although skilled personal field work makes heavy demands on those who carry it out, and is clearly much more expensive, the fullness of the material it provides makes it an essential instrument in such investigations.

EMETINE AND THE HEART

EMETINE is a general protoplasmic poison, and ever since Magendie and Pelletier [1] isolated the alkaloids of ipecacuanha there has been a steady flow of articles describing its toxic effects. Dyce Duckworth [2] was one of the first to draw attention to its toxic action on the heart in animals, but he was unable to demonstrate any definite effect on the blood-pressure. Wild,[3] on the other hand, using the pure alkaloids, found experimentally that emetine lowered the blood-pressure and caused diastolic arrest of the heart. In dogs, Levy and Rowntree [4] found that emetine produced a striking fall in blood-pressure, acute dilatation of the heart, and occasionally ventricular fibrillation. Histological changes in the myocardium, ranging from degeneration to necrosis, have also been described,[5] and Rinehart and Anderson [6] reported histological changes in the myocardium resembling those found in rheumatic fever. In cats and dogs, Boyd and Scherf [7] observed that emetine given intravenously produced a variety of changes in the electrocardiogram, including prolongation of the QRS interval, auricular extrasystoles, and tachycardia; large doses led to ventricular extrasystoles, with ventricular fibrillation as a terminal phenomenon.

Most of the textbooks stress the dangers of toxic effects on the heart, but it is difficult to find confirmation in the original articles on the subject. Brown,[8] for instance, encountered no cardiac effects in 554 cases of amœbiasis treated with emetine subcutaneously, while Heilig and Visveswar,[9] in 45 cases of acute amœbic dysentery, found that even intravenous administration of emetine had no serious effect on the cardiovascular system, although they point out that intramuscular therapy is safer than intravenous. In some of their patients whose electrocardiograms were abnormal on admission to hospital, the administration of emetine was even followed by an improvement in the record. Two reports of experience during the 1939–45 war seem to support the view that the toxic action on the heart is negligible. In 72 cases of amœbic dysentery treated at the Gorgas Hospital in the Panama Canal Zone,[10] electrocardiograms were taken before, during, and after treatment with gr. ½ of emetine hydrochloride subcutaneously twice daily for ten days, and only temporary changes were found in the electrocardiograms.

1. Magendie, F., Pelletier, P.-J. *J. Pharmacie*, 1817, **3**, 145.
2. Duckworth, D. *St Barts Hosp. Rep.* 1869, **5**, 218; 1871, **7**, 91.
3. Wild, R. W. *Lancet*, 1895, ii, 1274.
4. Levy, R. L., Rowntree, L. G. *Arch. intern. Med.* 1916, **17**, 420.
5. Chopra, R. N., Ghosh, B. N., De, P. *Ind. med. Gaz.* 1924, **59**, 338. Epstein, D. *Quart. J. Pharm. Pharmacol.* 1932, **5**, 21.
6. Rinehart, J. F., Anderson, H. A. *Arch. Path.* 1931, **11**, 546.
7. Boyd, L. J., Scherf, D. *J. Pharmacol.* 1941, **71**, 362.
8. Brown, P. W. *J. Amer. med. Ass.* 1935, **105**, 1319.
9. Heilig, R., Visveswar, S. K. *Ind. med. Gaz.* 1943, **78**, 419.
10. Hardgrove, M., Smith, E. R. *Amer. Heart J.* 1944, **28**, 752.

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In just under half the cases temporary changes occurred in the T waves, and in 7 cases there was some prolongation of the P–R interval, only once exceeding the upper limit of normality and then only to 0·24 second. In one case the electrocardiographic changes were slightly more definite, and, with the clinical findings, suggested the possibility of "mild myocardial infarction," but the evidence is far from convincing. Comparable findings are reported by Cottrell and Hayward [11] in an electrocardiographic study of 32 New Zealand troops receiving emetine intramuscularly (gr. 1 daily for 10–12 days) and 8 receiving emetine bismuth iodide. Temporary diminution or inversion of the T wave occurred in 25 of the records after emetine, and in 12 there was slight prolongation of the P–R interval. No significant change was noted in the blood-pressure or pulse-rate. The consulting physician, Middle East Forces, remarked that he knew of "only one certain case and one doubtful case of toxic action of emetine on the heart occurring in that Command up to the end of 1944."

If the recognised limits of dosage are not exceeded, and if the patient is always kept in bed while emetine is being given, there seems to be little risk of toxic effects on the myocardium. If it is forgotten that emetine is a potentially dangerous substance in large doses accidents may happen.

THE INSTITUTIONAL CHILD

A YEAR ago the Government appointed a committee, with Miss Myra Curtis as chairman, to inquire into the provision made for children who by loss of parents or otherwise have been deprived of a normal home life. This committee, which includes Mr. Somerville Hastings, F.R.C.S., and Prof. J. C. Spence, F.R.C.P., has now published an interim report on one group of workers having care of such children—namely, resident staff of the house-mother type in charge of groups of children in small residential homes or in subdivisions of large homes. This group was studied first because, though they hold a key position in relation to the children, none of the present arrangements for training staff in child care are quite suited to their needs. There are courses for nursery nurses and nursery assistants, but for the house-mothers or house-fathers the only training offered is by some voluntary bodies for their own staff, and before the war by some local authorities, the Battersea Polytechnic, and the Vocational Training School, Bristol. During the war the Ministry of Health ran courses of training, but these lasted only a week and were designed for wardens and matrons of hostels for children in reception areas.

House-mothers, like other mothers of families, have to undertake a good deal of domestic work, but those at present appointed—often capable housewives and temperamentally fit to look after children—have rarely had the chance to learn much about the development and needs of the child, especially if he fails to conform to usual standards. The house-mother should be taught how to compensate him for the loss of his secure home background. The danger even in a good residential home is that children will be treated as groups rather than as individuals. The committee was warned by some that formal training would rob workers of their homely touch and unfit them for domestic work; but such predictions have not been borne out among workers trained by voluntary organisations. The committee therefore recommends that a Central Council for Training in Child Care should be set up to prescribe a curriculum, choose suitable residential homes for the training of students, arrange teaching centres for the theoretical part of the course, appoint examiners, select students, and approve a course for tutors in the theoretical work. It is suggested that two years' instruction, culminating in a certificate in child care (part I), would fit the student for a post as a house-mother or assistant house-mother, according to her age; while a further year, leading to part II of the certificate, would fit her for senior work and for promotion.

A house-mother, the committee thinks, should be able to take charge of a family group of 12 children ranging in age from 2 to 14 or 15. The corresponding male worker must be able to play the father's part; he needs an equal understanding of children though he will share more in their outdoor pursuits and recreation than the house-mother. Candidates must have enough education to profit by the course, and they should be over 18 and usually under 35, though some widows above this age who have brought up families are well fitted for the work. In order to attract suitable candidates grants will be needed to help them to take the course. Their salary on qualifying should be commensurate with their training; though not on a level with teachers or State-registered nurses, it will be above the level for domestic workers, at whose rates they are at present paid.

The scheme is attractive. Visitors to residential schools sometimes notice a reserved wary look on the faces of the children, not compatible with a sense of security. House-mothers are often kind, well-meaning, and able, but harassed by lack of help—as the committee note—and inclined to have an appearance of anxiety unsettling to the children who live beneath it. In the last few years we have seen some dreadful consequences befalling children taken from their parents, and though these must not weigh unduly against many happy and successful foster relationships, we should keep them in mind when planning to do better. The committee believes that its scheme will not cost more than £5000 a year—a small price to pay for a very wise measure.

TINEL'S SIGN OF NERVE REGENERATION

THE central problem in the treatment of nerve injuries is to estimate the extent of the damage to the nerve. This conclusion began to emerge in 1914–18 and has been reinforced by the experiences of 1939–45. The problem arises from the fact that in the early stages after injury similar signs appear when the nerve is completely divided (neurotmesis in Seddon's terminology) and when the axons only have been interrupted, leaving the supporting tissues of the nerve intact (axonotmesis). If the nerve is not operated on spontaneous recovery will take place in the latter case, but not in the former. Of course intermediate conditions may occur: some bundles in a nerve may have suffered only axonotmesis whereas others may be so badly damaged (without loss of continuity) that they will not recover spontaneously.

It is especially important for those managing such cases to make a correct decision in good time, because with every week of delay the condition of the denervated tissues becomes less favourable for regeneration. Since the manifestations of degeneration and denervation are similar in the two cases the surgeon must make as much use as possible of the earliest signs of regeneration. In this issue are published two studies of the hyperexcitability to mechanical stimuli which is characteristic of the very thin young axons. Unfortunately, the controversy as to the value of Tinel's sign, which is based on this hyperexcitability, is not fully resolved by these papers. Dr. Konorski and Dr. Lubinska, of Poland, have succeeded, under the difficult war-time conditions of evacuation to the U.S.S.R., in making a quantitative analysis of the excitability at various periods of regeneration in animals. Their suggestion that the ambiguities of Tinel's sign might be overcome by testing the mechanical excitability of the exposed nerve meets the serious difficulty that one can hardly examine any great length of nerve in this way. Moreover, the time of examination is so critical that it is

11. Cottrell, J. D., Hayward, G. W. *Brit. Heart J.* 1945, 7, 168.

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doubtful if exploration at the right moment would often be practicable. Captain Nathan and Major Rennie have provided valuable additional evidence about the relation of the sign to the progress of recovery. They themselves comment that further and still more detailed investigations of this sort are desirable, and they admit that the principles on which they have used the sign for the management of cases are subject to exceptions. Perhaps it is still not realised how great is the regenerative power of nerve-fibres. Some axons may cross areas of fibrous tissue several centimetres long and then advance down the nerve and produce an advancing Tinel's sign. According to the first principle adopted by Nathan and Rennie, one should not explore the lesion in such a case, but their own series includes three of these nerves which gave no later signs of regeneration. One would indeed expect such cases, for the presence of fine axons in the peripheral stump of a nerve does not indicate that satisfactory regeneration is certain, and this is the reason for the scepticism of those who doubt the value of the sign.

However, the great problem of the neurosurgeon is to create for himself, as soon as possible after a nerve injury, a picture of the true condition at the site of the lesion. Mechanical hyperexcitability is a characteristic of the youngest fibres, and its disappearance is a sign that they have increased in diameter and become medullated. Further quantitative information about the magnitude of the phenomenon, and the time and rate of its appearance and disappearance at each level below the lesion, may yet provide a valuable aid to diagnosis. In spite of much study the surgeon still lacks a satisfactory means to make the early decisions about nerve lesions which are essential if he is to give the patient the best chance of recovery.

HOUSEFLIES

THE intermittent patches of hot weather which constitute the British summer seem to be already upon us, and the housefly season is imminent. Fly nuisances, like the poor, have always been with us, and it remains to be seen whether we can solve these two problems of social security. For the fly is a danger, though familiarity with it has bred indifference to its disease-carrying habits. Even if the risk is small to adults in well-built urban districts, there remain the risks to infants, to sick people in hospitals, and to people in rural areas with primitive sanitation. Moreover, the mere irritation of flies in large numbers is sufficient reason for their extermination.

During the past years of war we had to contend with more difficult fly nuisances than ever before. In the destruction of war, the fly finds new breeding sites in which to thrive, and furthermore sanitary measures suffer from lack of man-power. On the credit side has been the impetus to applied science which has developed and applied new synthetic insecticides. These developments have lately been reviewed by Craufurd-Benson,[1] who was in charge of an entomological unit of the R.A.M.C. and had experience of fly control in the field in Italy and elsewhere. Under such conditions it was difficult or impossible to reduce fly breeding by improved disposal of refuse and the Army had to rely upon insecticides.

As a "fly spray" to be used directly against flying insects with a hand sprayer, D.D.T. by itself is not entirely satisfactory because of its slow action. Pyrethrum, which was the active constituent of most pre-war insecticides, causes a spectacular "knock-down" but the flies sometimes recover. A combination of D.D.T. and pyrethrum gives the advantage of rapid and completely lethal action. The proportions are of the order of 0·03% to 0·05% pyrethrins plus 0·05% to 0·5% D.D.T. No doubt sprays of this type will be on sale to the public soon. The peculiar advantage of D.D.T., however, is its lasting effect as an insecticidal film on surfaces sprayed with it. To obtain this effect, a fairly strong solution (4 to 5%) must be used and the walls of the room to be treated must be thoroughly sprayed. One treatment will remain active for two or three months and should, therefore, last through the fly season. The new British insecticide 'Gammexane' (formerly known as 666 in a crude form) can be used in the same way; but fewer trials have been made to define its value.

The chemical control of larvæ in their breeding material is well known to be difficult. In small accumulations, such as field latrines, *ortho-* and *para*-dichlorbenzene have been found effective. In large refuse dumps, however, it is practically impossible to exterminate the larvæ because of the great bulk of the refuse in which they may be hidden in small pockets. As an alternative measure, the surface of the dump can be regularly powdered with D.D.T. or gammexane, which contaminate and kill the adult flies as they emerge.

Last summer the Ministry of Health published an article, giving practical recommendations for dealing with fly infestations,[2] which should be of assistance to medical officers of health and others. The importance of regular collection and efficient disposal of refuse is emphasised, and it is to be hoped that in these directions higher standards will be attained as labour becomes available. Full directions are given for the application of D.D.T. spray to give a persistent effect, which should be carried out next month in such places as hospitals, maternity hospitals, children's homes, and nurseries.

DIPHTHERIA IMMUNISATION IN COPENHAGEN

IN Denmark centralisation makes it easy to obtain data not so readily forthcoming in countries with a diversity of machinery and administration. Immunisation against diphtheria is a case in point. The same diphtheria antitoxin and toxoid, and the same technique of administration, are to be found throughout Denmark, where the standard procedure includes three injections, with an interval of a month between the first two and an interval of a year between the last two. In *Nordisk Medisin* for March 22, Dr. J. Ipsen reports investigations on this subject carried out at the State Serum Institute and Copenhagen's fever hospital, Blegdamshospitalet. During the past 25 years there have been four waves of diphtheria in Copenhagen, with peaks for the first three in 1920, 1928, and 1935. The fourth wave had not subsided at the date of publication. Until 1941 the ratio of child to adult cases was as 5 to 1. During the fourth wave, in 1943, this ratio was 1 : 1·8 and in 1944 it was 1 : 2·2. There was nothing very impressive in the absolute number of cases of diphtheria in 1944 (only 870) as compared with the corresponding figure for 1928 (2029), but in 1944 there were as many as 601 adult cases, whereas in 1928 they numbered only 287. Had the ratio of child to adult cases been the same in 1944 as it was before 1941, one would have expected about 3000 child cases in 1944 instead of the 269 cases actually registered in this year. Hence Ipsen's conclusion: "It is permissible to conclude that the immunisation, which in 1944 included more than 90% of all the children in Copenhagen between the ages of 4 and 15, has effected the great decline in the morbidity among children. Further, we may conclude from the great number of adult cases that diphtheria bacilli in 1944–45 are more widespread in the population of Copenhagen than at any time previously during the past 25 years." But unfortunately the 1943–44 epidemic has shown a case-mortality much above that of earlier waves.

1. Craufurd-Benson, H. J. *Brit. med. Bull.* 1946, 3, 780.

2. Stock, P. G., Busvine, J. R. *Mon. Bull. Min. Hlth E.P.H.L.S.* July, 1945, p. 147.

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Special Articles

DISABILITY AND DISABLEMENT

THE MEDICAL ASPECT

HAROLD BALME
O.B.E., M.D. Durh., F.R.C.S., D.P.H.
MEDICAL OFFICER IN CHARGE OF REHABILITATION, MINISTRY OF HEALTH

THE twin problems of disability and disablement are attracting much attention. They form the basis of the Disabled Persons (Employment) Act and of the various actions arising out of that important piece of social legislation; they are the subject of further legislation in the Industrial Injuries Bill, now before Parliament; and they provide the material for the comprehensive report recently issued by the International Labour Office.[1]

There is a tendency to regard these new developments as merely affecting employment exchanges, labour officials, industrialists, and sociologists. This direction of emphasis is due to the fact that the question of disability in these various reports and statutes is linked up with the selection of suitable employment for the disabled person, and that the Ministry of Labour and National Service has been made responsible for setting up a register of all disabled persons and affording them assistance in the form of industrial rehabilitation, vocational guidance, training for alternative occupation where needed, and selective placement in industry. The employers of industry, for their part, have been placed under statutory obligation to receive a fixed quota of disabled persons (under certain conditions) into their works, and to reserve certain types of employment for persons so handicapped, whilst sheltered workshops are to be provided for those who are able to do regular paid work but are unfit to stand up to the conditions of competitive employment.

But the problem of disablement, and the fitting of the disabled person into the productive life of the community, cannot be dismissed as a matter which only concerns employment exchanges and labour officials. It is primarily a medical question, and no scheme of rehabilitation or resettlement will ever succeed except under medical direction and close medical supervision. The I.L.O. report, referred to above, contains a detailed account of the various steps which have been taken, or are under preparation, in Great Britain, in certain Continental countries, in the United States and South America, and in the Dominions, to provide satisfactory training and employment for the disabled, particularly for those crippled during the war; but throughout the report there is constant reference to the supreme importance of early recognition of potential disability by the physicians and surgeons treating the patients, and of the closest association of the doctor with those responsible for vocational training and resettlement. "Doctors should consult with employment officers, occupational therapy merge into extensive work-reconditioning, and an employment objective be fixed before the medical profession has relinquished its responsibilities."

DEFINITIONS

At this point the question may well be asked what exactly is meant by disablement, and in what respects it differs from mere disability. The distinction is an important one, for whereas disability affects a person in one particular sphere of action, it only constitutes disablement if it prevents him from following his normal course of life. In the words of the Act, a disabled person is one who "on account of injury, disease or congenital deformity is substantially handicapped in obtaining or keeping employment, or in undertaking work on his own account of a kind which, apart from that injury, disease or deformity, would be suited to his age, experience and qualifications." In the United States the definition has been carried still further, and disability is considered to be a definite handicap (and therefore to constitute a disablement) if (*a*) it requires the person to modify or change his employment; (*b*) it makes it harder for him to obtain employment; (*c*) it threatens to endanger his own health or safety, or that of others; or (*d*) it restricts the opportunities of a new recruit to enter trade, industry, or a profession.

It will be seen from these definitions that the first purpose of medical rehabilitation and of vocational guidance must be to prevent disabilities from becoming disablements, and to reduce the extent of the residual handicap in the case of those whose full restoration to their former functional capacity is plainly impossible. This was the prime object of the physical development centres, the rehabilitation departments, and the convalescent depots set up by the Services during the recent war, and of the large number of rehabilitation departments established under the Emergency Medical Service scheme of the Ministry of Health; the large proportion of recruits of poor physique (over 87%) who passed out in category A1 from the physical development centres, the 856 out of 1000 members of air crews with fractured spines who returned to full flying duties from R.A.F. rehabilitation centres, and the large numbers of Service patients and civilians who have left E.M.S. rehabilitation departments without disablement, or with only minor defects, all bear tribute to the success of the process.

SIZE OF THE PROBLEM

With the passing of the war, the need for the continued maintenance and extension of such methods of rehabilitation, for the benefit of the civilian population, is no less urgent, as will be seen at once when we consider the size of the problem. According to the I.L.O. report, it was estimated in 1942 that there were 11,000,000 persons in the United States between the working ages of 15 and 64 who had some form of disability, and that of that number 400,000 required rehabilitation followed by sheltered employment; 1,200,000 required special vocational training before resettlement in some entirely new form of occupation; whilst 8,500,000 merely needed careful selective placement when their period of medical rehabilitation had terminated. If these figures are applicable to Great Britain, after making allowance for the difference in population—and it looks at first glance as though they represent a somewhat liberal estimate—it would mean that there may be well over 3,000,000 people of working age in this country possessing some form of disability for which medical rehabilitation is required; that over 2,000,000 will require expert advice as to a choice of occupation in which their disabilities will no longer prove a handicap—e.g., a sitting job for a man or woman who can no longer stand at work all day, or work in a reconditioned factory for the patient with chronic chest trouble; that over 300,000 will need to be specially trained for a new type of occupation; and that over 100,000 will need to be found work under sheltered conditions.

A consideration of these figures, and of all that is involved in the successful rehabilitation and re-establishment of so large a proportion of the nation's man-power, makes it clear that a heavy responsibility will fall upon the future health services if disability is not to result in irremediable disablement and consequent withdrawal from the productive life of the country. Let us now see what particular form the medical contribution will be expected to take.

1. Training and Employment of Disabled Persons: a Preliminary Report. International Labour Office, Montreal. 1945. Published in the United Kingdom by P. S. King & Staples, Great Smith Street, London, S.W.1.

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PREVENTION OF DISABLEMENT

In the first place it is clear that ample facilities for medical rehabilitation will be required throughout the country as an integral part of the new hospital service. It is the early recognition of potential disability, and the early adoption of suitable measures of physical and psychological rehabilitation as part of routine medical and surgical treatment, which help most in shortening convalescence and preventing or limiting residual disablement. All rehabilitation medical officers are agreed that their chief successes are obtained in patients who have been under supervision from the day of admission, and who have followed an appropriate programme of remedial exercises, recreational therapy, and occupational handicrafts from the first day on which they could be safely prescribed. It is the quadriceps and hamstrings drill given before and after cartilage operations, the wide range of movements against increasing resistance for all forms of fracture, the early abdominal exercises after laparotomy or childbirth, the special lower-thoracic and diaphragmatic exercises before and after thoracic operations or after serious respiratory disorders, and the early and sustained movements of fingers and hands after injuries and infections, which prevent serious disablement and reduce the period of invalidism to the minimum.

To fulfil such a programme a great extension of rehabilitation departments will be needed, in addition to those which have now been established in more than 300 civilian hospitals in Great Britain. Every hospital which undertakes to treat insured patients under the new health service should be provided with an efficient physiotherapy department, with accommodation, equipment, and staff sufficient to give active rehabilitation, where advisable, to every patient in the wards. Every town or district should have one or more outpatient rehabilitation centres, situated at a local hospital or specially set up by the health authority, and able to provide a full programme of expert rehabilitation to those who need to attend daily for the purpose, whether referred by private doctors, industrial medical officers, or hospital staffs. Every hospital area should have a residential rehabilitation centre outside the town, to which long-term patients could be transferred from the adjacent hospitals, and supplied with ample facilities in the form of good gymnasia, playing-fields, swimming-pool, and light and heavy occupational handicrafts. And throughout the country there should be special centres in which particular types of disability—orthopædic, tuberculous, paraplegic, or psychoneurotic—could be gathered together for purposes of investigation and rehabilitative treatment. It is only by the widespread establishment of such departments, and by the inclusion of regular instruction in rehabilitation in the ordinary medical curriculum and hospital practice of the country, that this important development in social medicine will find full scope.

VOCATIONAL GUIDANCE

The duty of the medical profession will not end with attempts to prevent residual disability and disablement. Serious illness and injury will continue to take their toll of the population, and, in spite of all improvements in medical and surgical treatment, a large number of patients are bound to end up with loss of functional capacity. It is here that expert advice is needed in order to reduce the handicap caused by the disability and to guide the patient into the way of life and type of occupation in which he can find the highest satisfaction and be of greatest use to the community. Thus it is that vocational guidance, as it is now generally termed, is of such importance. But this vocational guidance, if it is to be both scientific and practical, must be based on such knowledge, and cannot just be left to a D.R.O. and a labour office. We need to know in the first place what the man can and cannot do, and what conditions would be prejudicial to his health or to his ability to stand up to a full day's work; and on this point it is the opinion of the physician or surgeon who has treated him, or the rehabilitation medical officer who has been reconditioning him, which is all-important. We need to know what he is willing to do, and whether he is able to move to another district and find more suitable work—and on this point the almoner who knows something of his domestic circumstances is an invaluable adviser. We need to know just what jobs there are in the neighbourhood, which he would have a chance of getting—if necessary, after special training. And we need to know what are the industrial conditions, and the particular muscular and psychological strains and stresses, involved in the various forms of employment at local works. In other words, successful vocational guidance with a view to good placement in industry is a team job in which patients, doctors, almoners, D.R.O.'s, and representatives of local industry all need to take a hand.

The ideal method of organising such team-work is by means of rehabilitation or resettlement conferences, such as have already been established experimentally at two or three hospitals. At such a conference any patient who, by reason of his disability, will need to change his occupation is brought under review and suitably advised, and reports are received of those who have previously been settled in occupation but who, for one reason or another, are not fitting happily into their new form of employment. When resettlement conferences are held in every hospital area, whether at hospitals or health centres, it should become the normal practice for both private doctors and hospital staffs to refer to them all patients requiring vocational guidance and selective placement. Meanwhile, large numbers of disabled persons are appearing for the first time, not at hospitals but at employment exchanges, as a result of the new register which has now been opened under the terms of the Act. This is unfortunate, as it means that they are seen at the wrong time, by the wrong man, and in the wrong place. It is medical advice and not industrial which these disabled persons first need, for in many cases their disabilities could be greatly reduced by a suitable course of medical treatment and rehabilitation, or by expert opinion as to the type of work they could best do or the conditions they should avoid. It is hoped that opportunity for such medical advice will be afforded.

STATISTICAL REVIEW

The register of disabled persons is to be open to everyone in the country suffering from a disability likely to last more than six months, and constituting a "substantial handicap" to the obtaining or keeping of employment. The only people excluded are children under working age and patients spending their whole time in hospitals or sanatoria. This means that a mine of valuable information will soon be available for analysis and study. It would be a tragedy if full use were not made of it. It is not merely important for purposes of classification and analysis, but, far more, for the light which it will throw upon the causes which lead up to disability, the conditions under which permanent disablement occurs, and the methods which are most successful in preventing or reducing a permanent handicap. The after-history of disabled persons should similarly be studied from a medical, as well as from an occupational, viewpoint, so that the results of rehabilitation, vocational guidance, and selective placement can be critically assessed and evaluated. There will be abundant work for many medical research committees, but the results of their studies should be of immense value in obtaining a more accurate knowledge of all types of disability, and of the means by which they can be prevented from becoming conditions of disablement.

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Medicine and the Law

The Judge and the G.M.C.

THE judgment delivered by Mr. Justice Charles in the slander action brought by Dr. A. H. Hennessy against Miss Irene Boyanton may have resounding consequences, inasmuch as it stated that the removal of the plaintiff's name from the Medical Register [1] had been a "gross miscarriage of justice." Dr. Hennessy, taking advantage (as has often happened) of the law of defamation in order to raise an issue vital to him, and alleging deliberate perjury on the part of his accuser before the General Medical Council, in effect secured the benefit of an appeal to a court of law against the decision to erase his name. The case may be described as the converse of the Spackman litigation in 1942. There the practitioner was found by the Divorce Court to have committed adultery with a person to whom he stood in professional relationship. Before the G.M.C. he sought to call fresh evidence which had not been produced (though available) before the Divorce Court. The G.M.C. declined to hear this evidence, accepted the divorce decree as prima-facie proof of the adultery, and directed the erasure of the practitioner's name. The Divisional Court, by a majority decision, held that the G.M.C. was right. The Court of Appeal unanimously decided that, while the council was entitled to regard the divorce decree as prima-facie evidence of adultery, it was bound to hear any evidence tendered by the practitioner, and that, having refused to hear such evidence, it had failed to make "due inquiry" under section 29 of the Medical Act. Dr. Spackman's name, it will be remembered, was restored to the Register in 1944. In the Hennessy case the sequence of events was the other way round; the G.M.C. decided first, and then a court of law reheard the facts (including some important fresh evidence) and in effect has over-ruled the G.M.C.'s decision.

The facts were stated by Mr. Justice Charles as follows. Miss Boyanton had been living for nine years in adultery with a married man. Just before Sept. 26, 1944, she received from him a disturbing and distressing letter wherein he said that he had met his happiness in Ceylon and did not intend to come back. In her distress she had turned to Dr. Hennessy for comfort, advice, and the treatment of her frayed nerves. In 1945, upon her complaint, his name was removed from the Register. She subsequently made statements to two persons that, on that day in September, Dr. Hennessy had made a violent attempt to ravish her and had indecently assaulted her. These allegations, which had been made before the G.M.C., Dr. Hennessy denied; he said they were sheer invention. The judge accepted his denials and refused to believe her statements. At the relevant time one of the doctor's patients, with her infant daughter, had been in the waiting-room adjoining the surgery, had seen Dr. Hennessy and Miss Boyanton come out, and had noticed nothing unusual about them. The court was satisfied that Miss Boyanton had lied both in uttering the slanders and in saying, as she had, that Dr. Hennessy had committed adultery with her regularly. If he had, what need had he to assault her criminally? His Lordship gave judgment for Dr. Hennessy with £2000 damages "to exhibit to the world at large that I do not believe a single word of the slanders—they are utterly untrue and no reflection whatever rests upon Dr. Hennessy."

The court could hardly avoid commenting upon the previous adverse decision of the G.M.C. Certain evidence (that of the mother and daughter who were in the waiting-room) had not been before the council. "I find it difficult to believe that, if they had had that evidence before them, they would not have believed it in preference to that of Miss Boyanton, for she patently lied; she has shown herself a willing and ready perjurer." The G.M.C., in the absence of adequate evidence, had accepted her story and "struck this wretched man off the Medical Register." The judge hoped that the G.M.C. would see their way to reinstate him.

Critics will find in these proceedings fresh ammunition in the campaign for allowing a right of appeal from the Medical Act tribunal to a court of law. There is no need to remind them that the two hearings are very different in their nature. In creating the G.M.C., the Medical Act did not attempt to dictate the manner in which the council should hold its inquiry. In the words used by Mr. Justice Humphreys in the Spackman case, "the General Medical Council is not a court of law but a domestic forum left to manage its own affairs as it considers best in the interests of the profession. It is not bound by rules of evidence; it has no power to administer an oath or to compel the attendance of witnesses. It may receive and act on hearsay evidence. Its rules permit the reception of written depositions or statements as well as of oral evidence. In short the council is free to adopt its own procedure and to decide on its own methods of proof so long as it obeys the dictates of natural justice." The proceedings in the Spackman case, said the late Lord Justice MacKinnon, were in no sense an appeal from the Divorce Court decision; "they were between parties different from those who were before the court." It will be hard, however, to make the public understand that the Hennessy slander action was not an appeal from the G.M.C., and harder still perhaps, in view of the characteristically outspoken language of the judge, to persuade the country that complete confidence may still be reposed in the final and unassailable findings of the council.

1. *Lancet*, 1945, i, 733.

Towards Social Security

The "Weekly Hansard"

THERE are still people in charge of medical libraries and common-rooms who have not heard that for 1*s.* 6*d.* a week they can buy a record of all that was said in the House of Commons during a whole week, as well as the questions and answers both oral and written. Even the most cynical critic of Parliament must admit that this is good value.

The *Weekly Hansard* contains the five daily issues (sold separately at 6*d.*) bound in a stout cover, and it arrives conveniently on Saturday morning for week-end reading. One soon learns where to turn for those delightful exercises in the use of the English language—the prepared answers to parliamentary questions. Crisp and clear, demure and never boastful, they seem to reveal the responsible Minister as mildly surprised at how right his department has been. As for the debates themselves, the printed word does not do justice to the spoken speech, but it deals very mercifully with the Member who made it. Not without reason is the officer in charge of the official report described as an editor.

The pagination is a little trying in the weekly edition, because written answers, with their own serials, are interspersed with the other matter in date order. But if the demand for the *Weekly Hansard* grows sufficiently, no doubt details of this kind will be straightened out. The postage on a single issue is 6*d.*, and the easiest plan is to send H.M. Stationery Office the subscription of £3 for a year. References to the National Health Service will no doubt occur often enough to justify perusal for that period.

The Tuberculosis Nurse with Tuberculosis

Should a nurse (or for that matter a doctor) who contracts tuberculosis while attending tuberculous patients receive financial compensation on the lines of the Workmen's Compensation Act? Hitherto the official answer has been "No," because tuberculosis has not been scheduled as an industrial disease.

In passing and by way of contrast I cannot help citing the interesting case of a city policeman named Garvin

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who succeeded in obtaining a special pension on the grounds that his tuberculosis was contracted in the execution of his duty (*Times* Law Reports 1943–44, p. 207; *Lancet*, 1944, i, 291). The case was taken under an Act, which provides that if a member of a police force is incapacitated for the performance of his duty by infirmity of body occasioned by an injury received in the execution of his duty, without his own default, he shall be entitled on a medical certificate to retire and receive a special pension for life. The City authorities refused a pension, but it was awarded on appeal to quarter sessions and the decision affirmed by the King's Bench divisional court. Mr. Justice Humphreys in his judgment said:

> "It would probably be impossible in any case of pulmonary tuberculosis to establish by evidence the day, or week, or perhaps even the month, during which the infection of the lung occurred, but where it is shown that the conditions of service during the critical period were such as to cause unusual mental and bodily strain, which, acting on a frame ordinarily healthy but at the time enfeebled by long hours of duty, frequent wetting and such matters rendered it more liable for such infection, I think that the injury might be described as being the direct result of, and therefore suffered in, the execution of duty."

The National Insurance (Industrial Injuries) Bill which is to replace the scheme of workmen's compensation does not extend the list of industrial diseases, but provides for the setting up of an advisory committee for this purpose. When the case of the nurses was pressed in the House of Commons debate the Minister, Mr. Griffiths, merely said it would have to be considered by the advisory committee along with all other matters.

Is He Hurt or Just Sick?

Until about fifty years ago the task of the practitioner was to get the patient well or ease his suffering. Since then, however, his purely medical function has been complicated by liability to be called on to express opinions about the origin of the trouble, such opinions having the consequence of financial benefit to his patients if they are "favourable." Not only has the doctor to give professional advice to outside parties, and medical evidence to courts of law, but a factor has been introduced into the doctor-patient relationship which does not always promote complete understanding. Moreover, the patient who feels in his bones that he is entitled to something better than he is getting does not help himself along the road to recovery. The intended abolition of lump-sum settlements and the substitution of permanent pensions (on the lines of war disability pensions) will help to improve the atmosphere. But however carefully the scheme is drawn, and however lengthy the list of industrial diseases, there will always be the borderline case where the patient feels and the doctor opines that the trouble is really due to conditions of work, but where the case cannot, in law, be brought within the four walls of the scheme. To cover some of the doubtful cases it would be necessary to open the door to many whose merit has no foundation.

Among the group of rheumatic diseases there are obviously some which sometimes owe their origin to the nature of the employment; how can there be proof or evidence, in particular cases, satisfactory to all parties? Again there are some neuroses which cannot entirely be dissociated from working conditions of strain. Against this background it is interesting to note the expression of opinion of one group[1] "that individuals should be given such a degree of security against unmerited loss of wages as to render unnecessary any separate treatment of incapacity due to industrial accident or disease." Such an idea has seemed to most people to be many years ahead of its time, but the Minister of National Insurance on the recent third reading of his Bill did give expression to his own hope of seeing a complete coördination of the social insurance schemes within ten years.

Despite the history and sentiment in favour of a separate injuries scheme, I shall watch with interest to see whether the boundary can be drawn clearly enough for general satisfaction, or whether a complete merger may not after all be the best solution for all concerned.

JUSTINIAN.

1. Assoc. of Approved Societies, conference proceedings, 1944, p. 22.

Public Health

RESEARCH IN MENTAL DEFICIENCY

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I WRITE to draw attention, not to possible future lines of research, but to the actual urgent and immediate need for local authorities generally to institute and encourage medical research in mental deficiency; for, apart from Birmingham and London, little appears to have been done by them in this respect, and neither Birmingham nor London itself is too prolific in its achievement. Recently the Mental Hospitals Association formed a section to deal with the work of the Mental Deficiency Acts committees, and it is hoped that one of the earliest activities of this new section will be to investigate this important matter.

Since the passing of the principal Mental Deficiency Act in 1913 many local authorities have opened homes, institutions, and colonies for mental defectives, and it would be of value to ascertain how many, if any, of them have been provided with facilities for research.

In 1931 and in 1938 two departmental committees reported on the essential structural requirements of colonies for mental defectives. The first of these, known as the Hedley Committee, discussed the requirements of colonies of 880 and 1270 beds, but nowhere in their report are recommendations made for the provision of facilities for research in these obviously large institutions.

The second report, prepared under the chairmanship of Mr. Adam Maitland and published in 1938 as the final report of the Departmental Committee on the Cost of Hospitals and other Public Buildings, deals as its title implies with all types of local-authority institutions, including the requirements of colonies for mental defectives as discussed in the Hedley report. In this comprehensive publication no recommendations, again, are submitted for the provision of facilities for research in mental deficiency colonies, although in the section dealing with mental hospitals it is recommended that:

> "There should be a clinical laboratory in which may be carried out routine investigations for the diagnosis of physical conditions, and particularly there should be facilities for bacteriological investigation whenever epidemic diseases arise. The question whether a research laboratory should be established in a particular mental hospital is a question for the local authority. We may observe that while the advantages of centralised research are emphasised by everybody it should not be forgotten that desire for research should receive encouragement wherever it may arise."

What is surprising in these two reports is the silence concerning research of the specialists in mental deficiency who were either members of the departmental committees or among those submitting evidence. No minority recommendations were issued, and the specialists appear to have been in full agreement with the conclusions published. It is difficult to understand why they did not suggest some reference to research in mental deficiency; but perhaps a little light is thrown on this matter when one considers that in no branch of medicine today is the general outlook and whole sphere of activity so dominated by the school teacher, the lay psychologist, and the social worker as it is in that of mental deficiency, and, however valuable the pioneer work of these able groups may have been, non-medical they are and as such cannot be expected to take a lively interest in medical research. Then again, as these two reports virtually imply, there is a tendency in certain psychiatric circles to regard the medical problems associated with mental defect as being different from those accompanying mental ill health, whereas an unbiased and more holistic approach would confirm that these problems are similar and that the understanding of both these groups of mental disability is essential to the fuller comprehension of the wider concept of mental hygiene.

It seems so elementary; but, in view of what has been written, it appears to be necessary to affirm that mental defectives are subject to the same physical and mental illnesses as the other members of the general community.

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The existence of mental defect does not render the individual particularly immune from the ordinary ailments of mankind; indeed, quite the contrary is their case, for mental defectives as a whole are constitutionally more delicate and consequently less tolerant to strain and stress and more susceptible to disease, both mental and physical. Although the nursing of cases of established mental disorder is forbidden by law in mental-deficiency colonies, the beginnings of such illness can be more easily studied in the mentally defective in whom the mental mechanisms are simpler than in the more complex personalities found in mental hospitals. Obviously, then, the same clinical and research facilities should be provided in institutions and colonies for mental defectives as, at least, are available in mental hospitals. Pathological, bacteriological, and biochemical laboratories are as essential in the one type of institution as in the other; in addition, physiological and psychological laboratories would be of value in mental-deficiency colonies, for many studies in connexion with the developing body and the maturing mind might be undertaken with advantage there.

I should add that these views are my own and not necessarily those of the local authority which manages Coleshill Hall.

Luton

A comprehensive, well-illustrated, readable report on an area by its medical officer of health is something of a novelty, especially in restricted war-time conditions. In his *Report on Luton*[1] Dr. Fred Grundy gives a fine lead to other authorities. The book is admirably produced, and covers a wide range of local-authority services. Besides photographic illustrations, it contains an excellent series of maps and pictorial statistics, and in the statistical analysis Dr. Grundy has had the assistance of Mr. R. M. Titmuss, who has already done much to develop the study of the social aspects of public health.

The primary aims of the report "are to provide essential information about housing needs and population, and to review existing services and industry in relation to wider problems which confront the borough council." This is not a plan for the town, but a guide to planning for the next ten years. It represents groundwork on which building can be done. The survey tells us that Luton is a clean, vigorous industrial town with every prospect of rising importance, but with no great pretensions to architectural merit or antiquarian interest. Everywhere in the report are signs of a robust desire to grow and prosper, and to provide increasingly good services and amenities for the people of the town.

With a population of over 100,000, Luton is by far the largest town in Bedfordshire, but it has not yet acquired the status of a county borough. It has grown rapidly since the beginning of the century, when its population was 36,404, and even more remarkably since the depression of 1931. One can therefore understand that the authors of the survey feel a certain impatience with a situation in which their major services of health and education are still under the control of the county council. Moreover, Luton very properly supplies a large surrounding area of villages with such services as electricity, and its industries provide work for many rural inhabitants. The town has a high proportion of skilled workers, and a relatively low professional and managerial group. It is a town of artificers. The age structure does not differ greatly from that of England and Wales.

The housing situation is less acute on the whole than in many industrial areas: the proportion of families occupying overcrowded houses has risen from 0·51% in 1936 to 1·0% in 1945. But this figure compares favourably with that of England and Wales (3·8%). The total housing needs of the borough for the next ten years are estimated at over 12,000, but of these only 5000 are required to complete slum-clearance programmes (890) and to compensate for war damage and lack of building. The remainder is an intelligent anticipation of the needs of newcomers, and the replacement of houses over 80 years old.

1. Report on Luton: a Study of an Industrial Town. Prepared for the borough council by Fred Grundy, M.D., D.P.H., and Richard M. Titmuss, in collaboration with many others. Luton: Gibbs, Bamforth & Co. (Luton) Ltd. 1945. Pp. 139. Cloth-bound, 21*s.*; paper-bound, 12*s.* 6*d.*

The report contains useful observations on the size of houses, about which the following conclusions are reached:

1. When fairly large housing estates are developed, a few blocks of flats should be built which provide for one-bedroom or two-bedroom flats on the ground floor suitable for old people.
2. The upper floors of these blocks should contain a number of small flatlets and one-bedroom or two-bedroom suites suitable for single persons living apart from their parents, and suitable as temporary accommodation for newly-married couples.
3. Otherwise, houses with three or more bedrooms should be built.
4. These should include a substantial proportion of houses with four or five bedrooms.
5. In all housing plans a generous margin of space should be provided in order to take account of the demand for higher standards, the need for extra room in times of sickness and confinement, and the implications of the population crisis.

In dealing with housing and population the authors are treading on firm ground, because they are concerned with the functions of their own authority. When they come to educational and health services, however, one would expect them to tread more delicately, since many of these are primarily a county responsibility; and in this respect they do not exercise as much forbearance as one might have hoped. Apart from this blemish their report is vigorous and effective, and it has the special value of calling for action rather than contemplation.

Infectious Disease in England and Wales

WEEK ENDED APRIL 13

Notifications.—Infectious disease: smallpox 3 (1 case at Southend, 2 imported cases at Liverpool); scarlet fever, 1366; whooping-cough, 1934; diphtheria, 463; paratyphoid, 4; typhoid, 3; measles (excluding rubella), 2552; pneumonia (primary or influenzal), 871; cerebrospinal fever, 78; poliomyelitis, 5; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 270; puerperal pyrexia, 124; ophthalmia neonatorum, 68. No case of cholera or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 2 (0) from measles, 8 (1) from whooping-cough, 6 (0) from diphtheria, 61 (12) from diarrhœa and enteritis under two years, and 24 (2) from influenza.

The number of stillbirths notified during the week was 236 (corresponding to a rate of 30 per thousand total births), including 34 in London.

Diphtheria in Europe

The comparison of disease incidence in different countries is complicated by varying standards of notification; but certain definite long-term trends are identified in a recent report on the incidence of diphtheria in Europe.[1] For nearly fifteen years the incidence in Germany has slowly and steadily increased, whereas in neighbouring countries it declined until the German invasions of 1940. From 1941 there was a pronounced increase in Norway, the Netherlands, Belgium, France, and Czechoslovakia, which reached its peak in the winter of 1943–44. Geographically, diphtheria has a hard core of very high incidence in the North Sea area, including especially Hanover (100 per 10,000 population per annum in last three months of 1945), and Schleswig-Holstein (80 per 10,000 population). This area extends westwards into the northern and western provinces of the Netherlands, and eastwards Berlin has an equally high incidence. In the remainder of Germany and the Netherlands, in Austria and in Czechoslovakia (apart from Slovakia), the incidence is also high, but less than half that in the North Sea region. The incidence is definitely low in England, Denmark, and Sweden, owing to direct measures of control, particularly immunisation.

1. Stowman, K. UNRRA Health Division. *Epidem. Inf. Bull.* 1946, **2**, 147.

SMALLPOX IN MANCHESTER.—A Service man who recently returned to Manchester from the Far East has developed severe smallpox. All known contacts have been vaccinated.

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In England Now

A Running Commentary by Peripatetic Correspondents

AN attack of pneumonia lately put me in hospital and then in a convalescent home. My work has been non-clinical for years, so I was less familiar with hospital *mores* than might be expected of a medico. I had many surprises—things were not done with the finish of my young days—and one shock, the diet. That it was limited in range, ill-cooked, and neither hot nor cold was expected, for I had been back in England some time. What disturbed me was the successful, and apparently deliberate, attempt to banish taste and flavour from everything served. Delicate inquiry of sisters and the medical super disclosed the pride they felt in maintaining the diets so closely to pre-war practice despite rationing. These dishes, they added, with all the solemnity of an ex-cathedra utterance, were the acme of years of experience, and were quite the best diet for the patients. Commentless I returned to contemplate the coloured flour and water they called soup, the —but why be harrowing? I realised of course the difficulties of present-day catering and cooking, but here they were irrelevant. The authorities believed their methods provided a diet "light and easily digestible and necessary for invalids." I will not assail their view on physiological or nutritional grounds, vulnerable though it is, but only record the subjective observation that it was almost unbearably annoying.

At the time I could eat little. Yet I craved food, but food of colourful vigorous taste, aromatic, individual, pungent, spicy food of character. With poignant longing I recalled chile con carne, enchiladas, shish kabab, grenadillas, goulash, Schweinnierenbraten mit Apfelmuss, the saffron-rich chicken pilau of Persia and Turkish dolma, Chinese pork ribs in sweet and sour sauce (ja pi gwut, I think), spicy pumpkin pie, Aberdeen smoked cod and burn trout fried in oatmeal, curry made by a Goanese, bortsch, langouste, Kobenhaven smørgasbrod, loquats from Funchal, and mebas from the Cape, moules marines, Basra dates and leban, Jewish gefüllte Fisch, Stilton and blue Wensleydale, the green and purple figs of Lebanon, crystallised fruits from Damascus, Cape Cod clam chowder, Georgia peach-fed sugar-cured ham, Californian abalone, red caviare with blinnies, lychees in syrup, oh! and Cape gooseberry pie, cockie leekie, the fine black puddings peculiar to Cork, fried sweetbread (*not* thymus) and Ayrshire bacon, Polish beetroot soup with the spicy sausage-roll-like morsels to go with it, South Australian "French plums," Sachertorte, smoked salmon and salmon bisque, Edinburgh shortbread and treacle scones, mangoes, and a Lancashire hot-pot (real) with oysters and mushrooms . . . nearly all of which are quite impossible here now—and will be for a long time, but notice that all these beautiful things are at one in having character and individuality.

I do not think that my illness caused any parageusis, but rather that my inhibited alimentary apparatus demanded a keener stimulus than that afforded by the unimaginative and dogma-ridden authorities. I submit we may all have been planning patients' diets on wrong lines, and in an effort to lighten their digestive labours have unwittingly added to the sufferers' burden by proffering food reduced to the very nadir of neutrality. I have noted—though with little attention till my own nose was rubbed in the problem—that the whole province of hospital catering is being investigated. Deo gratias. It is not before its time. Here then is my humble and heretical contribution to the solution. *Savour is more important than calories or vitamins.* If the food is appetising and the serving sufficient the patient will get enough calories. If he really needs vitamins they can be exhibited in pill form, and the physician can then be sure they are not destroyed in the kitchen.

* * *

The surgeon's position on board a floating whale factory is peculiar in this, among other things—that he is the only member of the crew not entitled to a bonus. (One reason given for this anomaly is that, were he bonus-minded, he might be tempted to drive to work poor men who should rightfully be on the sick list.) All others may watch with anxiety the daily production of oil and meal, reckoning their bonus accruing—or not, as the case may be. The surgeon, in splendid isolation, if he be entirely selfish need not worry if he never sees another whale. I have not yet reached this extreme of selfishness, though the other day when I took a toss on the "plan" deck I was very near it. I was wearing shorts, so the ice-cold blood and slime got home at once, and, when I stripped, my "cheeks" were redder than the reddest rose—and far less sweetly smelling. Fortunately it was the dinner hour and the only person to witness my discomfiture was a flenser for whom I'd done several tooth extractions. Did he grin!

My search for the whale's pancreas has been successful, as well it might seeing that this widespread organ weighs some 100 lb. A surprising thing to me, and one which gave trouble in the cleaning of my specimens of pancreas, ear, eye, and penis, with all of which my cabin is gracefully decorated, is the extreme toughness of the whale's connective and other tissues. No wonder the flensers have to hone their great knives every few minutes. The sclerotic, for example, is just a ring of dense bone.

One night, in a blizzard, I was required to go in a "catcher" to a Norwegian factory ship to assist at an appendicectomy. The minute surgery out-Martha'd Martha in its encumberment and was not free of cockroaches. The "table" was a few boards covered with a blanket, and such amenities as gowns and masks had all to be improvised. Our 'Pentothal' did not do its stuff quite as it should and so ether was given by a complete novice. With skill the young Danish surgeon performed the essentials and I hear the patient did not turn a hair. Nature *is* wonderful!

* * *

In some old scrapbooks I have come across two items with a topical flavour. The first is a letter I wrote to the *Saturday Westminster Gazette* of June 17, 1911, headed "Contract Medical Attendance." Leading articles in previous issues had regarded "payment on a contract basis for medical attendance as an ideal method for the doctors." My reply, referring to "a large body of opinion in the medical profession against this method," followed lines that now appear rather out of date, but a protest against underpayment for contract medical work might even today awake a responsive echo. Some of my paragraphs of 1911 show considerable resemblance to utterances of 35 years later:

> "Every day in thousands of homes and consulting-rooms preventive, as well as curative, work goes on, the former unheeded by statesmen, because not available in public health reports."
>
> "The quality of medical work cannot be inspected, as a block of concrete is inspected, or analysed chemically. It depends on something more imponderable, the mental and moral outlook of a man."

I must have enjoyed writing that bit, with its touch of the sonorous! My peroration, too, might do for 1946: "If statesmen honestly seek the public good they will foster the nobler possibilities of the profession, and the medical service will be a fine one."

The second cutting is from the *Manchester Guardian* of Dec. 28, 1911:

> "A Manchester lady was telling her sister all about the operation her little girl had successfully undergone a few days ago. She said: 'I saw my darling put under chloroform, and then I left, but I was so very anxious I waited outside the bedroom door. I heard the doctors' voices and listened, and—would you believe it?—they were actually talking about the National Insurance Bill!'"

Soon after the Bill became an Act I went abroad to practise, and it was not until a score of years later that I returned to England to become a "panel doctor." Will this designation persist, I wonder, in the levelling and, it is to be hoped, halcyon days of 100%?

* * *

I recently rang up a well-known consultant, and instead of being answered by his efficient secretary I found myself speaking to his wife. I apologised for phoning rather early and inquired if it would be convenient to speak to her husband. "Oh it's quite all right," she replied cheerily, "he's not doing anything important; he's washing up the breakfast things."

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Letters to the Editor

EMPLOYMENT OF HOSPITAL STAFF

SIR,—In the letter from the chairman of the British Hospitals Association in the *Times* of April 12 there occurs this sentence with reference to the local hospital management committees: "They must appoint their staff as their own employees."

Many members of the profession have expressed themselves ready to concede a good deal for the assurance that they will not be the paid employees of local authorities or their health committees. How much better off should we be in a similar relation to voluntary hospital committees? There is a strong argument here for unified ownership of all hospitals and for contracts, if contracts there must be, with a central hospital authority.

How often do any of us stop to consider who "owns" a hospital? The essential thing for us, and also, we believe, for the patients, is that the medical committees of the district hospitals should be as strong relatively as those of the teaching hospitals, and well represented on the management committees.

London, W.1. E. ROCK CARLING.

SYPHILITIC INFECTION IN THE INCUBATION PERIOD

SIR,—The ability of the syphilitic to transmit his infection while the disease is still in the incubation period, though an established fact, is not generally realised; whether this is brought about by means of infected seminal fluid or from direct contact with an invisible infected abrasion is of academic interest only.

Since returning to civil clinic practice I have been impressed by the number of married women who become infected by their husbands while the latter are on leave from the Services and that most of these infections come from Germany. The wife more often than not comes to the clinic on a complaint from the husband that he has developed a primary sore one or two weeks after returning to his unit and he often accuses her of having infected him. Almost invariably careful examination discloses no sign of either vulval or cervical ulceration and the serological tests are negative, but on repeated examination during the following month the inevitable chancre makes its appearance and is confirmed by dark-field examination. The importance of repeated examination in such cases is obvious.

A careful explanation of what may happen if extra-marital intercourse takes place within two or even three months before an anticipated leave should be "put across" to the troops in no uncertain manner. A true understanding of the facts may prevent the break-up of many a home.

London, W.2. G. L. M. MCELLIGOTT.

WHITHER MEDICINE?

SIR,—May I butt into the discussion between Major Lipmann Kessel and Dr. John Grieve on the relationship of science to philosophy and of both to medicine? In any case Major Kessel is too far away to reply while the argument is still hot in our memory.

Perhaps his criticisms were "rather sweeping," and perhaps his definition of "philosophy as the science of thought" was not precise enough for a learned discussion in a learned journal. As Dr. Grieve so correctly points out, the original meaning of the word is "the love of wisdom," which is itself dependent upon the processes of thought developed to a very high degree, and exercised at a more profound and more fundamental level. Undoubtedly philosophy is "more fundamental than the science of thought," if by thought we mean the simpler processes of the mind which are used daily by all of us when thinking about simple daily tasks. Nevertheless it still remains true that the better philosophers today do apply the scientific method to the processes of thought, and to those other related processes carried on at a more fundamental level, and upon which wisdom depends. Thus it is true that philosophy involves the application of the scientific method to the processes of thought.

Nor do we need Hamlet to remind us that all is not capable of scientific explanation. The application of the scientific method guarantees nothing. We are only asked to use the method of experiment and observation as a guide. That which we see clearly constitutes our knowledge; that which we perceive only as through a glass darkly lies just beyond our horizon; and that which is beyond again we can only guess at. I think it is Dr. Grieve who is showing us his own limited outlook when he speaks of the term science as having a restricted meaning. How can it be so? As he correctly points out, the original term *scientia* "covered all natural knowledge or the branch of philosophy known as natural philosophy." Today it has come to have a wider meaning still. It was Hegel who first introduced the idea of dialectics into philosophy, and briefly this may be said to mean that every idea depends upon its relationship to other ideas, and that in effect it is a resultant of two opposite ideas. Karl Marx applied this principle to the material world, and thus brought the whole of philosophy into the realm of natural philosophy. Marx's view has been amply confirmed in special cases—in biology by the theory of evolution put forward by Darwin and developed and confirmed by later biologists; in physics by Einstein's theory of relativity, which also makes use of that fundamental idea that every phenomenon observed in the material world depends upon its relationship with other phenomena, and is in fact a resultant of opposite forces; and in physiology, where the conception is well understood although given no special name. Thus our whole view of science is for ever broadening, and cannot be regarded as narrow. It includes also "that much neglected part of man, his soul." Dr. Grieve here admits that the soul is a part of man, and if so we cannot separate it from his life, his quality of livingness, and so from science. I do not say that science can immediately, or even in the future, tell us what the soul is. That is another matter.

As for the doctors whom Dr. Grieve knows, who use their patients for "a series of laboratory exercises," they are beneath contempt, for they are neither scientists nor philosophers in any sense, and the best remedy would be to use them for the same purpose. If we were educated not only to be doctors but to be "social human beings" as well, that problem would not often arise.

P. W. ROE,
Lecturer in Physiology, University of Durham.
Newcastle-on-Tyne.

BLOOD-TRANSFUSION IN MAXILLOFACIAL INJURY

SIR,—Captain Hayton-Williams's interesting letter of April 13 makes it clear that the problems of maxillofacial surgery in India were somewhat different from those of the maxillofacial units in Europe.

In North Africa and Europe gross infection in jaw wounds on arrival at base was not common. There were only two notable exceptions—the early jaw wounds from Tunisia and from Salerno. As in Burma, this result was determined by the tactical situation and the long line of evacuation (in all three cases). Secondary hæmorrhage was therefore probably rarer in the German than in the Japanese war. In one maxillofacial unit (with Major R. Laurie and Major K. Roche, and on the dental side Major T. Wilson and Major A. Green) there were 7 arterial secondary hæmorrhages in some 1500 jaw fractures and over 3000 maxillofacial casualties of all sorts. None of these patients died. This incidence, of under 1%, is probably representative of the incidence in other maxillofacial units in Italy and Europe. It is low, and depended on thorough *early* surgery and dental fixation more than anything else, and would undoubtedly have been higher had the majority of cases not had this treatment in the first 3–4 days.

It was our impression that the danger of secondary hæmorrhage from jaw wounds was more from suffocation than blood-loss. Many of these wounds communicate with the pharynx. Many have their jaws lashed together. A very small hæmorrhage into the nasopharynx of these cases can be an immediate threat to life. In many cases the anæsthetist's job is more difficult than the surgeon's. Once a tube is in the trachea, and the pharynx has been sucked out and well packed off, control of hæmorrhage by local or proximal carotid ligation is generally straightforward. The difficulties of the anæsthetist are increased by the

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digital pressure which may be the only means of controlling hæmorrhage during induction.

It was our experience too that only a minority of jaw wounds needed blood or plasma in the early stages, and that then it was most often given to maintain the blood-pressure for the extra 1–2 hours needed for the primary closure and repair of a major mandibular wound. In the main Cassino battle, when 221 maxillofacial casualties were treated, only 10% needed blood or plasma in the first two days, and in only 2 or 3 cases was it considered life-saving. The Forward sorting ensured that over 90% of these casualties reached the maxillofacial unit in 8–12 hours. For comparison with the transfusion needs of other groups of casualties it may be mentioned that 20% had multiple injuries. About 70% were fragmentation wounds, and 30% due to small arms.

London, W.1. PATRICK CLARKSON.

SIR,—Captain Hayton-Williams's letter calls for some comment in respect of the third group of cases to which he refers. His suggestion that a slow intravenous glucose-saline drip be maintained until 12 days after injury is astonishing, and it is to be hoped that others treating such cases will not be influenced by this advice. I cannot agree that to maintain a continuous glucose-saline drip, to permit rapid blood-transfusion in the event of secondary hæmorrhage, is a reasonable or sensible precaution.

Personal experience of large numbers of facial casualties under the varying conditions of three different overseas commands does not support Captain Hayton-Williams's statement that secondary hæmorrhage is "very likely" in cases where surgical treatment is delayed, although, of course, hæmorrhage is more frequent than in those patients who have received early and adequate treatment.

In the event of a secondary hæmorrhage a transfusion of blood or plasma can be set up sufficiently quickly in any organised medical unit. A cannula and vein that have been in use for a number of days will not lend themselves kindly to a rapid blood-transfusion, and most surgeons would prefer to depend on a freshly inserted cannula or needle.

In my opinion, in his advocacy of the maintenance of a glucose-saline drip until the twelfth day, Captain Hayton-Williams is recommending a measure which is neither rational, practicable, nor necessary in anticipating the occasional case of secondary hæmorrhage.

If the prolonged glucose-saline transfusion is justified as a means of correcting and maintaining adequate hydration, I would suggest that, after initial resuscitation, I have yet to see a case where a sufficient fluid intake could not be maintained by oral fluids or gavage.

I need hardly detail the snags, difficulties, and possible abuses of long-continued intravenous transfusion. As your correspondent truly says, "A great deal was learnt and published during the war about maxillofacial injuries . . .": it is to be hoped that the slow glucose-saline prophylactic drip will not be considered as an advance in maxillofacial technique.

St. Bartholomew's Hospital, London. R. S. MURLEY.

PENICILLIN ON SALE

SIR,—We were walking in one of the main streets in Beirut today when we noticed penicillin advertised for sale in the window of a large chemist's shop. Out of curiosity we walked inside and were shown some penicillin for intramuscular use and some penicillin tablets ('Ledercillin'). The assistant in the shop who served us was loud in his praises of the tablets, and not realising he was talking to two doctors told us we should be cured after twelve tablets. He proposed we should buy these for £35 Syrian (almost £4 sterling). We left the shop and had gone a short distance when, as often happens in Middle East transactions, the boy rushed after us and said we could have the tablets for the reduced price of £30 Syrian. It would have been rather fun to have gone back and bargained. Perhaps we might have got them for £29 Syrian or had a packet of razor blades or a few tablets of sulphapyridine thrown in.

Amusing as this incident was, we were somewhat horrified at the idea of tablets of penicillin presumably for oral infections being sold to the public without any medical control.

Beirut, Lebanon. R. P. WARIN. C. SOUTH.

BODY TEMPERATURE AND OVARIAN FUNCTION

SIR,—The papers by Barton and Wiesner [1] and Halbrecht [2] on rectal temperature in relation to ovarian function illustrate the significance of body temperature in subfertility and as an early sign of difficulties during pregnancy. The data indicate the close relationship between hormonal changes and body temperature.

These workers recommend that the temperature should be taken in the rectum on waking. A study of 150 cycles in 41 women [3] revealed, however, that strict adherence to one body orifice was not necessary, and that the evening temperature is often a better guide than the morning one. All patients chose to take their vaginal temperature in preference to the rectal. Those who took

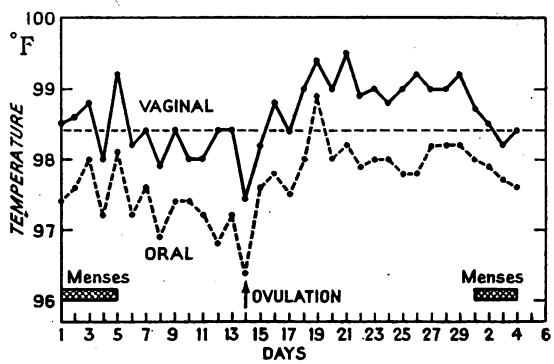

Fig. 1—The parallel pattern of vaginal and oral temperatures.

the vaginal and oral temperatures simultaneously showed in 34 cycles an almost identical pattern (fig. 1). It was found that the oral temperature was more sensitive to hormonal changes than the vaginal, and also that it rose higher under the influence of progestogen, and fell lower with œstrogen (fig. 2). Thus the study of both curves may reveal predominance or lack of one or other hormone. Increased œstrogen produces a wider space between the curves, while the action of progestogen with œstrogen deficiency is to raise the oral temperature frequently to equal that of the vagina.

Evening temperature records were found to be preferable to morning readings because many patients omitted to take their temperatures in the morning rush. There is a significant difference between waking and evening

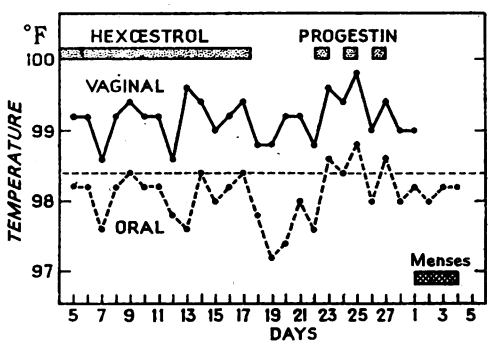

Fig. 2—Vaginal and oral temperatures in a patient with irregular, infrequent menses. Hexœstrol 5 mg. t.d.s. was given until the 17th day, and progestin 15 mg. intramuscularly on alternate days from the 23rd to 27th day.

temperature, which is particularly marked in combined oral and vaginal temperature curves. Where both the oral and vaginal temperature were taken twice daily there was a greater difference between the evening than the morning curves. This is due to the vaginal temperature being higher in the evening while the oral temperature is either unchanged or usually lower than on waking. This is of considerable significance in the evaluation of combined temperature graphs.

The finding of undifferentiated endometria during well-marked high-temperature (H.T.) phases and of

1. Barton, M., Wiesner, B. P. *Lancet*, 1945, ii, 663.
2. Halbrecht, I. *Ibid*, p. 668.
3. Nieburgs, H. E. *J. Obstet. Gynæc.* 1945, **52**, 435.

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negative pregnanediol results during early H.T. phases confirms the results of Hamblen and others.[4] In a study of 58 women correlated with endometrial biopsies it was found that 43% of patients bleeding from progestational endometria excreted no pregnanediol, and 62% of patients bleeding from œstrogenic endometria excreted pregnanediol in amounts equal to those found with progestational bleeding. That progestogen definitely raises the body temperature was first observed by

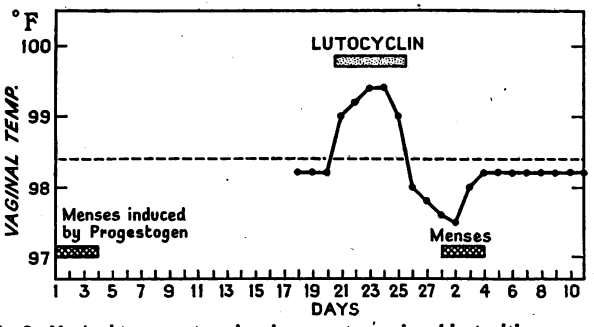

Fig. 3—Vaginal temperature in a hyperœstrogenic subject with amenorrhœa. Lutocyclin 60 mg. sublingually was given on days 20-25.

Martin,[5] and was confirmed by my investigation[3] of body-temperature changes when progestogen was given by the intramuscular or oral route (figs. 2 and 3). No more than two phases were observed in any of the 150 cycles, and the common postmenstrual temperature rise and mid-luteal decrease seems to represent the normal variations during both phases, since the follicular curve never rises as high as the curve in the luteal phase.

Cyclic changes in body temperature appear to be largely under hormonal control, and yield valuable diagnostic data not only in regard to ovulation but also in relation to various menstrual disorders.

London, N.W.6. H. E. NIEBURGS.

PULMONARY ŒDEMA IN CHEST WOUNDS

SIR,—The results from the treatment of pulmonary œdema recounted by Harper and Tait in their article of April 13 are depressing indeed. I am stimulated to comment on their article because my own experience with the use of concentrated plasma in pulmonary œdema (to be published) was far more encouraging.

In the case-record presented, Harper and Tait state that the patient admitted to their operating centre already showed evidence of pulmonary œdema. In Italy, it was observed occasionally that over-ambitious transfusion of chest cases at the field ambulance level resulted in a pulmonary œdema being present when the case reached the operating centre. No mention is made in the case-record of any transfusion before the patient reached their hands. This is most important, for it was well recognised that venesection aided the over-transfusion type of case in just the dramatic manner described in their patient.

In their opening paragraph Harper and Tait point out that the ultimate effect of the pulmonary œdema is obstruction to the flow of air into the alveoli. In spite of this, no mention is made of a preliminary clearance of the trachea and larger bronchi by suction, a method which produces an immediate response though not a sustained one, and which is of immediate priority in treating pulmonary œdema due to trauma. Unless the mechanical obstruction to air-flow is relieved before oxygen administration is begun, it is unreasonable to suppose that concentrated plasma can have any valuable effect, for it cannot be expected to remove fluid from the smaller bronchi by its osmotic action.

Turner[6] indicated that 40 c.cm. of five-times concentrated serum produces a 5% dilution of the blood (by osmosis) in 70 minutes when administered in 2–3 minutes. He was using the concentrated serum in cases of head injury where, presumably, capillary suboxygenation was not present to increase fluid loss into the interstitial tissues. This quantity of five-times concentrated serum is approximately equivalent to 70 c.cm. of triple strength plasma in its protein concentration. It is therefore unreasonable to suppose that 20 c.cm. of triple strength plasma given half-hourly to a patient who has already presented evidence of over-permeability of capillaries by developing pulmonary œdema, and who is also suboxygenated and liable to further abnormal loss, will produce any very definite effect. In my own experience 400 c.cm. of triple strength plasma given over a period of 45–60 minutes was the minimum and usual dosage necessary in successful cases.

The difficulty of deciding what method of treatment to apply in pulmonary œdema due to chest injuries (and other forms of trauma) is only equalled by the difficulty of assessing the value of the treatment adopted. In one case, venesection alone may produce a successful outcome. In the next, the administration of concentrated plasma alone may be successful. In a third case, every means of clearing the airway (suction, coughing, posture, &c.), combined with oxygen administration, preliminary venesection, and subsequent administration of concentrated plasma may be required. In a fourth, all means will fail. And who is to say that the fourth case was not in reality a case of irrecoverable peripheral circulatory failure due to trauma in which the pulmonary œdema was merely a terminal event, rather than the cause of a terminal event?

I suggest that your readers should withhold their judgment on the value of concentrated plasma in pulmonary œdema until they have read the experiences of others and preferably until they have tried it themselves in suitable cases.

Glasgow. GAVIN CLELAND.

DOUBLE-EXPOSURE RADIOGRAMS OF THE CHEST

SIR,—Double-exposure X-ray films, the use of which in cases of asthma, emphysema, &c., was described by Dr. Maxwell in your issue of April 6, can also be used with advantage in pulmonary tuberculosis. I have found them of special value in the management of cases of artificial pneumothorax and also of artificial pneumoperitoneum and phrenic operations.

The double-exposure film gives, so to speak, a permanent record of screening and so enables one to study and discuss it more thoroughly at one's leisure. It is also of great value for demonstration purposes. It is a common experience for anyone treating pulmonary tuberculosis to wish to screen a patient who may be too ill to be moved to the X-ray department; a double-exposure film, which can be taken with the portable apparatus, is then of great assistance.

I feel sure that when enough material is available for fuller study and analysis we shall be able to understand much more about the "behaviour" of the lung, and have a better insight into the management of the artificial pneumothorax, &c., through the introduction of double-exposure radiography.

H. C. MUKERJI,
Preston Hall, Maidstone. Senior Resident Medical Officer.

EXPERIENCE IN THE FORCES

SIR,—I wish to support Dr. L. Rich's objections (April 13) to the present accepted axiom that all Service medical officers are professionally inferior creatures and are in urgent need of rehabilitation. "Rehabilitation" has long since passed from the medical to the political sphere, and now that docile Thomas Atkins is no longer available in sufficient numbers, we must needs seek material elsewhere.

Since my own "rehabilitation," I have had contact with many ex-Service doctors, some of whom have been prisoners-of-war, while most have served in field units for five or six years. (I have helped to rehabilitate a colonel!) Some of the 1939 vintage went straight from their final examination into the Services. Others had six or twelve months of hospital experience before joining up, while others had been in practice or in one of the civil services for varying periods. I have talked to them in "refresher" courses and socially, and a few have been my house-surgeons. So subtle are the influences of repeated propaganda that they all believe that they are inferior beings. They are not. While it is true that they have missed the blotting-paper advertise-

4. Hamblen, E. C., Cuyler, W. K., Baptist, M. *Amer. J. Obstet. Gynec.* 1942, **44**, 442.
5. Martin, P. L. *Ibid*, 1943, **46**, 453.
6. Turner, J. W. A. *Lancet*, 1941, ii, 557.

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ments of proprietary drugs and may not have heard of "Somebody's" test or syndrome, they have lived a communal life and have had much greater opportunities for informal discussions and arguments than are possible in civilian life. They have learned how men live when well and have seen the varied reactions of the human being to pain and fear, excitement and boredom, discipline and responsibility. Surely no better training for a doctor could have been "laid on." All that we, the seniors, have to do is to restore their confidence in themselves and to counter-propagate propaganda.

Aberdeen. WM. ANDERSON.

COACHING, TRAINING, AND TEACHING

SIR,—At a time when the resources of medical education are being replanned and expanded, it would I think be useful to define these three complementary activities.

Coaching is the assembling of knowledge in preparation for a test of mental assimilation—i.e., the examination. Coaching may follow teaching, but should never precede or coincide with it.

Training is the acquisition of techniques by practical experience. It may coincide with teaching, but should never precede it.

Teaching provides a fundamental introduction, a critical survey, and a challenge to original thought; it promotes judgment and insight, enthusiasm, and inquiry. It should precede and accompany training, but never degenerate into coaching.

Clever young graduates, with a fund of systematic knowledge, make good coaches; able technicians may make good trainers. But teaching calls for a balanced view of the part and the whole; it demands a broad outlook and a deep insight, with scepticism for the established and an open mind for the new.

When coaching is allowed to predominate in education, the body medical presents itself as a cleanly dissected corpse. When training is given more than its due, the result is a robot. Only when teaching is given its proper scope and precedence does this body medical emerge as a growing living organism.

London, W.1. L. S. MICHAËLIS.

MASS RADIOGRAPHY

SIR,—Since 1941 I have followed with keenness Dr. Brailsford's writings on this subject, but his letter of March 30 suggests that he cannot be familiar with the actual working of mass-radiography units. It is the practice in nearly all such units for the clerks to take a short but stereotyped history from all the volunteers before their X-ray. Surely Dr. Brailsford will admit the value of such a history. Would he waste valuable medical man-power in the taking of histories from the 93% of those examined who will be found to have radiologically normal chests? I can assure him that abnormal cases get due attention at every stage and that their history is taken by a competent and experienced medical officer.

The fundamental issue is not whether the large film is superior to the miniature film—for each method is serving a different purpose—but whether the miniature film has been failing in its purpose. It should act as a sieve mechanism to weed out the abnormal from the normal chest films; no attempt should be made to use it for diagnosis, or for the assessment of activity, or for serial observations of a lesion, for which a large film is needed. Has he any evidence that the miniature film has failed in its purpose to "spot" lesions, especially small lesions? At the moment about 20 units are operating under the national scheme, and experience has been sufficient for this question to be answered.

Personally, I have been surprised by the constant ability of the miniature film to detect small lesions. Tuberculosis officers and chest physicians have commented on the surprising clarity with which the very small lesions stand out, owing to the high contrasting qualities of the film. I should be interested to hear from Dr. Brailsford of a better alternative, which incorporates speed in dealing with large numbers, low cost of operation, and an equal standard of efficiency.

Dr. Brailsford has missed the point of my statement that I could see no reason why 2880 volunteers a day should not be dealt with by each mass-radiography unit. How can efficiency suffer when three separate teams are each working an eight-hour shift throughout the twenty-four hours? Surely, munition and aircraft components did not suffer by production in an identical manner during the war?

Dr. Brailsford uses the phrase, ". . . a few more roads . . . to clear a lake of fish." Why should one deride such a positive attempt? At least some progressive effort is being made, which is better than sitting at the lakeside and calling for the help of some mystic power.

The small beginning is not to be despised; I feel sure that the dispensary system at its inception had its critics, but time and progress have shown its value. My own experience leads me to think that mass miniature radiography, if correctly handled, can give valuable assistance in the field of chest diseases, both in diagnosis and in research.

Nottingham. A. E. BEYNON.

SUPPLIES OF STREPTOMYCIN

SIR,—Your correspondent, Dr. Grenville-Mathers, who referred to the lack of supplies of streptomycin (April 13, p. 557) may be interested to know that a short article appeared on page 226 of the *Pharmaceutical Journal* of April 6, 1946, stating that persons who require streptomycin should send their requests to Dr. Chester S. Keefer, chairman of the Committee on Chemotherapeutic and Other Agents, National Research Council, 65, East Newton Street, Boston 18, Massachusetts.

The note says also that, since the drug is in the experimental stage, details of the nature of the illness and of the organisms causing it must be furnished, "preferably by the doctor in charge of the case." Each request will be considered and if approved shipment will be made by the manufacturing laboratories.

Welwyn Garden City, Herts. F. WRIGLEY.

PARALYSIS AGITANS: A DISCLAIMER

SIR,—During 1945 a group of private persons interested in ascertaining the cause of, and in finding a cure for, paralysis agitans, approached the National Hospital, Queen Square, and, voluntarily forming themselves into a "Parkinson's Research Society," decided to raise funds to support research into diseases of the nervous system with special reference to paralysis agitans. At a meeting held at the hospital in July, 1945, the members elected a chairman and committee, and, by donations and covenants, provided a sum of money which was handed to the hospital for the prosecution of the research in question. To this lay committee was added a member of the honorary medical staff of the hospital, while I became the honorary secretary of the society.

Steps had been taken to start this enterprise, when, early in this year, it came to my knowledge, and to that of members of the honorary medical staff, that the chairman of the society, without previous consultation with the hospital authorities and on his own initiative, was notifying members of the society and some sufferers from paralysis agitans, by letter, that in fact the cause of the disease had already been found to be bacterial and that a cure for it had been discovered. The name and address of a medical practitioner not connected with the National Hospital, in respect of whom these claims were made, were given in these letters, and patients were advised to put themselves under his treatment.

The board of management of the National Hospital is advised by its medical committee that these claims cannot be endorsed, and that it is not in the public interest that the hospital should collaborate with an organisation that sponsors and gives publicity to them. I am therefore authorised to ask the courtesy of your columns for an announcement that the National Hospital dissociates itself wholly from the Parkinson's Research Society and from all claims made by it. The chairman of the society has been so informed and the two members of its committee who are connected with the hospital have resigned from the society. The members of the society have been offered the return of their donations and subscriptions which were given to the hospital for the purposes of the proposed research.

The National Hospital, Queen Square, W.C.1. H. EWART MITCHELL, Secretary.

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THE NATIONAL HEALTH SERVICE

SIR,—As time passes it seems obvious that if the National Health Service Bill is passed into law it will completely destroy the freedom of the medical profession by any of four well-aimed blows.

The first and most fatal blow is that there has been no opportunity for the profession to save its liberty by negotiation before the Bill was presented.

The second blow is that the Minister dictates the hospital, consultant, and general-practitioner service, with the profession having no effective power to govern its own affairs above the level of local executive councils. These councils only have disciplinary and disbursary functions.

The third blow is the decision to prevent medical practitioners owning the goodwill and freehold of their practices. Basic salary and capitation fee, in whatever arranged proportion, are equivalent to salary and must lead to direction of practitioners and loss of independent medical attention. The public will suffer with their doctors by this outrageous proposal that doctors cannot own their goodwill as can other professions which are free, for their doctor will always have his eye on the State officials to be sure he is not being over-generous to any of his patients.

There could well be a general-practitioner service of salaried type for those doctors who prefer this form of service and for those patients who do not object to communal surgery attendance while leaving the majority of doctors the freehold of their practices. By this combination of salaried practice and freehold practice, the public and the profession would safeguard their rights and avoid monopoly medicine.

The fourth blow is that the charitable bequests and endowments which have been bestowed on the voluntary and great teaching hospitals of the country are to be transferred to the ownership of regional and hospital governing boards under the control of the Minister, thereby striking a mortal blow at the independent consultant service in the hospitals, at their traditions and at local pride, replacing private benevolence by official rigidity. How much more practical it would be to give State subsidies in proportion to the needs of each voluntary hospital, in exchange for the acceptance by the hospitals of adequate central coördination of effort and perhaps of the purchase and supply of the numerous requisites for treatment and maintenance.

London, W.1. GEORGE ROSSDALE.

SIR,—It is surely time that someone protested against some of the arguments now being used in opposition to a salaried health service. There is really only one main argument—namely, that doctors who receive salaries will inevitably become so corrupted by their new relation to the State that their patients will no longer be able to count upon them for the disinterested and unsparing service which they now obtain. The public is actually being told (I have heard it) that we shall, under State compulsion, refuse certificates of unfitness for work to those whom we know to be unfit; that doctors will be unable to give proper and sufficient medicines because the State will require them to prescribe only what is cheap; and, worst of all, that we shall become such miserable parodies of our present selves that we shall meekly submit to this sort of State compulsion.

To me, and to many others, it seems that our ideals are quite strong enough to overcome the dangers of bureaucracy, and that any policy which denies this is damaging to the profession.

Sevenoaks, Kent. GORDON WARD.

SIR,—The successful solution of a problem demands a correct approach. We must recognise that we live in a period of historical change in which the relation of people to the means of production is modified and unrestricted private enterprise ends. Medicine must also evolve. A higher level of technique demands a firm integration of all branches of medical science. The private practitioner must go, but the individual contribution within the integrated whole will be increasingly valuable and freedom of thought and action will be gained.

This last statement needs amplifying. Freedom of private practice leads to congregation in the wealthier areas and a division of medicine into two standards, a good one for the moneyed and a bad one for the workers. Liberty to compete for patients and to exploit carries the contradiction of enslavement of the mind which must conform to narrow rules and even wilfully reject learning which would endanger the stability of this state. Freedom in socialised medicine implies the removal of the present commercial doctor-patient relationship and the substitution of a social relationship and the right to work in good conditions with the best apparatus for a reasonable income. Leisure will be much greater and all will be able to keep up to date and to research on their particular interests. Medicine and humanity will gain enormously and only the antisocial who plough a lonely, lucrative furrow will lose.

A National Health Service is not only desirable; it is a component of social evolution and therefore inevitable. The choice is between scientific coöperation and reaction. The former will enable us to modify any scheme in a socially necessary way and to ensure legitimate benefits for ourselves, while the latter would indicate a vested interest in ignorance and avarice.

In the organisation of the National Service one thing is essential: there must be democratic election, and if necessary expulsion, of administrators. We quite rightly fear the "army type"; but this will be our service and it will be our duty to run it well. In this task a social conscience is as important as professional ability.

Cranford, Middlesex. C. RAEBURN.

SIR,—You plead the high aims of the scheme for a National Health Service, as if that were an argument for its soundness. Obviously it is not; it is the effect which matters. The Government is trying to counteract poverty and its disabling environment, but the effect of steadily increasing social services is to discourage health by reducing the value of wages to those who earn them.

Sir John Anderson lately told us that the sovereign of 1945 had the same value as 8*s.* 4*d.* in 1913; but the sovereign of 1913 had the same value as 10*s.* in 1895, as Snowden showed at the time. A £5 wage today looks silly compared with a wage of the same nominal value in 1895; and governments in their puzzle-headed benevolence are making the poor poorer and so aggravating, not curing, ill health. The 1834 Poor Law Commission report said "there is scarcely a single statute dealing with the administration of relief which has not either aggravated the evils it was meant to prevent, or created new ones," and its successor in 1905–09 said that the Workmen's Compensation and the Old Age Pensions Acts, both aimed specially at the poor-law, had been factors in the increase of pauperism. What can save the Beveridge scheme from the same consequences?

The Beveridge report obscures the truth by taking the year 1900 as its base; but a little research would have shown that that year ended a decade in which nearly 1½ million babies died from epidemic diarrhœa—a mortality which was admitted to be exceptional, and should never recur on that scale. The report gives the impression of immense progress since 1900, effected by the work of this century. The truth is that the infantile mortality had attained by 1890 a rate of decline which, but for this interruption, would, if merely maintained, have brought about results at the end of 1901–10 better than those actually attained. Sir George Newman pointed out, in his 1933 report, that the mortality of childhood and adolescence never fell so fast as it did in 1860–90. During the present century, on the other hand, the emphasis of progress has shifted from the younger to the elder groups.

The soundness of the old Liberal doctrine that State gifts to the wage-earners must always be at the expense of real wages was negatively illustrated last century by a more than fifty years' rise without such gifts; positively, in this, by the uniform trend to falling real wages, only relieved in war-time, and countered by the quack remedy of ordering higher money wages. In order to make the poor-law unnecessary, the State has been lavishing money. Even in 1936 the amount spent

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on "social services" was returned at £503,000,000, including the poor-law—an amount which, capitalised at 2½%, already makes a sum of £20,000 million. This is a regular liability and would be entered to debit on any sound balance-sheet. We have not yet discharged the debt on the Napoleonic wars; we have added two more war debts each of which dwarfs that; and this is a peace-time debt which soon will exceed the three put together. The lesson which statesmen never seem to learn is that they can do more by raising real wages than by any amount of administrative benevolence. The State cannot conduct a social service with profit to the nation. The Insurance Act (Health) has been followed by a steady increase in the morbidity; two formidable rises in the phthisis mortality; by a fall with gathering momentum in the survival-rate of infants who attain to a second year of life, until that fall has become a menace to the future of England; all foreseen and predicted as results of the method, and all corrected during two wars which had the effect unprecedented before 1914, of raising real wages. Our rulers should be called upon to show that the method which they propose to extend has not been the cause of these unhappy phenomena.

A doctor is necessarily an evolutionist; he knows that there is in nature no case for a highly centralised *guiding* force but that everything is left to favourable individual variations. Even the leaders among our present reactionaries have at unguarded moments made nonsense of their revolt against evolution. Thus Sir William Beveridge at the end of his report says: "Freedom from want cannot be forced on a democracy or given to a democracy. It must be won by them."

London. B. G. M. BASKETT.

RELEASE OF R.A.F. DOCTORS

SIR,—Dr. Peter Cheshire's letter of April 13 expresses most accurately the feelings of all volunteer R.A.F. medical officers. The injustice of the release scheme for doctors is quite evident and is irrefutable; yet the simple measures required to remove it are still "under discussion."

May I support Dr. Cheshire's appeal with an account of my position? I am M.O. to a small flying unit 700 strong. Last July I consented to take over the medical work for a local Army unit of 250. The strength of this unit soon rose from 250 to 550. In February of this year I was approached by the medical officer of another Army unit, who asked if I would favour him by taking over his duties in order that his demobilisation might not be delayed. Understanding that his unit was due soon to be disbanded, I consented to do his work. Two weeks later his unit had not only showed no signs of being disbanded but had increased considerably in size—a situation which I must admit has a certain limited humour.

As a result of these voluntary commitments I have recently been caring for more Army than Air Force personnel. The anomaly of the situation requires no stressing, and no ministerial juggling of figures can make me believe that our complaints are being treated any more seriously by Mr. Bevan than were those of Cinderella by Baron Stoneybroke.

R. M. EMRYS-ROBERTS.

PERIODICITY OF INFLUENZA

SIR,—Your leading article of April 13 has taken my mind back to 25 years ago when, in a short article with the same title, I supplemented the evidence given by Dr. John Brownlee in THE LANCET of Nov. 15, 1919. The evidence which Brownlee had given for London was expanded by me with figures relating to Liverpool, the 96 English Towns, and the American Cities, and is summarised in a graph based on Brownlee's 33-week cycle—the epidemic, however, failing to eventuate when it is due in the autumn. I concluded my main observations as follows:

> "If it should prove correct that there were three strains of influenzal virus, each with a periodicity of 33 weeks, and that simultaneously all three strains became enhanced both in virulence and infectivity, then we are faced with a phenomenon without an exact parallel, although the behaviour of the meningococcal viruses" (I should have said "types," the word virus being then used more loosely than at present) "during the present war presents some points of similarity."

The evidence for the third virus was rather weak, being based on the occurrence of simultaneous outbreaks in May, 1918, in Spain, the Grand Fleet, and Liverpool and Glasgow.

Subsequently Greenwood and Carnwath in their report (1920) to the Ministry of Health referred to "some immunological differentiation of the third from the first and second waves, a surmise concordant with the clinical experience that winter influenza was unlike that of the autumn." This was in conflict with Brownlee's and my own supposition—namely, that the virus of the autumn wave was of a different antigenic nature from those of the summer 1918 and spring 1919 waves.

The theory of world-wide enhancement of virus, which was essential to Brownlee's views, was later rather shaken by the evidence as to the importation of influenza from America during the war years of 1914–18 (summarised on p. 490 of my *Principles of Epidemiology*), and is not likely to receive commendation at the present time.

The value of the use of periodogram analysis, upon which Brownlee relied, in the measurement of the essential periodicity of somewhat irregularly recurring phenomena is open to question, though in his hands it gave some indication of the probability of the time of occurrence of future outbreaks of influenza. That three 33-week periods gives an interval of nearly 2 years possibly enabled the fitting—at least for a time—of a 33-week periodicity to the recurrent A and B outbreaks tabulated in your leader. Presumably the longer periodicity would depend on the basis of a specific antitype immunity lasting for some years. Such an immunity will not, however, explain the extraordinary phenomena of 3 or 4 recurring waves of influenza in a single city or in a whole country within a period of less than 2 years; Brownlee's periodicity, admittedly based rather insecurely upon a periodically variable virulence of the virus, did in fact fit the outbreaks in the years 1918–19 and, less adequately, in the succeeding years. Your table starts just at the end of the occurrences referred to in the notes by Brownlee and myself. It is very gratifying that the hypothesis of two or more types of virus should have been borne out by subsequent research in the laboratory, but the rapidly succeeding waves of influenza in 1918–19 have as yet defied explanation.

Liverpool. C. O. STALLYBRASS.

DEATHS AFTER CARBARSONE

SIR,—Two deaths have lately come to my notice as a result of the use of carbarsone in normal quantities given for amœbiasis. One of these cases was as follows:

A woman of 32, previously healthy, was treated for amœbiasis with 1 gramme of chiniofon daily by mouth for 8 days. Her condition improved. Two weeks later abdominal pain returned, together with diarrhœa. The patient was given carbarsone (Lilly) in the usual quantity of 0·25 g. twice daily. On the 8th day of this treatment, fever and headache resulted, and the carbarsone was discontinued after she had received 3·75 g. Next day general symptoms of meningitis were observed. She was admitted to the Municipal Hospital "Hadassah" in Tel-Aviv and died there 5 days later. Necropsy showed a hæmorrhagic encephalomyelitis.

I should like to know whether there have been any records of similar deaths after the administration of this drug in the usual dosage. This is of particular importance to us because amœbiasis is a common disease in our institutions.

Central Office of the Sick Fund, Tel-Aviv, Palestine. JOSEPH MAYER, Medical Director.

*** A woman of 55 years, who received 5 g. of carbarsone by mouth in ten days for diarrhœa of unknown cause, died after developing acute fatty degeneration of the liver and exfoliative dermatitis. Ervin Epstein, who recorded this case in 1936 (*J. Amer. med. Ass.* **106**, 269), could not find any record of other fatalities from carbarsone in therapeutic doses.—ED. L.

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Parliament

ON THE FLOOR OF THE HOUSE

WHEN Parliament reassembles next week it will at once settle down to three days' debate on the second reading of the National Health Service Bill, which will give the maximum opportunity for discussion at that stage. Any relevant matters of principle, whether in the Bill or out of it, may be discussed on second reading, and as the Bill interests all parties very deeply the three days will be well filled.

Nevertheless, from the political party point of view it does not give rise to very acute differences of opinion. Mr. Churchill, speaking on April 17, said: "The Bill is not a party Bill in the ordinary sense," and added "it is a Measure in which we all have a great common share." Because of this the Opposition leader asked that the committee stage, after second reading, should be taken "on the floor of the House" instead of in standing committee upstairs. This the Prime Minister promised to consider, but he seemed to prefer reference to standing committee. Detailed discussion in committee will in any case extend over May and June, after which the Bill will be returned to the whole House at the beginning of July. After that there is still the debate on third reading. The Bill will then go to the House of Lords, which often functions nowadays as an additional form of committee stage involving further consideration by the House of Commons of the Lords' amendments.

These matters of procedure are important because all parties desire to get the Bill on to the statute-book in the autumn. As there is very great interest in it ample time is being given for discussion at all stages. The debate in the House of Lords on April 16, initiated by Lord Moran, shows how in that chamber there is a large measure of support for the principles of the Bill but also a wide field for "committee" amendment.

The medical parliamentary group, which includes M.P.s belonging to the medical and allied professions of all parties, met Dr. Guy Dain and Dr. Charles Hill of the British Medical Association before the Easter recess. The health group of the Labour Party, which includes medical and non-medical M.P.s specially interested in health matters, have been meeting regularly during the last few months and considering the local-government as well as the purely medical side of the Bill.

MEDICUS, M.P.

FROM THE PRESS GALLERY

Curtain Raiser

In the House of Lords on April 16 Lord MORAN, P.R.C.P., called attention to the white-paper on the National Health Service and moved that

> This House, while regretting any measures which might impair the efficiency of the general practitioner's service, welcomes proposals for the better coördination of the hospital services of the country.

It was difficult, he said, for a doctor nurtured in the voluntary system to speak of its extinction with detachment, but there were three questions which he thought should be faced.

In the first place was a drastic reorganisation of the hospital system of the country necessary? The answer to that was to be found in the surveys lately drawn up for the Ministry of Health, which were a measured statement of facts amounting at times to an indictment. Of the 93,000 beds in the 1059 voluntary hospitals of England and Wales a third were in hospitals with less than 100 beds. Most of these hospitals were too small to be first class In too many of them major surgery was performed by men without surgical training, and the duties of physicians were usurped by those who had not had the training of a physician. Of the 152,000 beds in the municipal hospitals, 78,000 were general beds, and of these 29,000 were in public-assistance institutions which often provided little more than food and shelter.

In the future, Lord Moran continued, voluntary hospitals would have greater difficulty in balancing their budgets and they could not themselves begin to meet the capital expenditure called for by the dilapidations of the last six years. They would have to ask the Government for a large sum, and public expenditure on a large scale must bring some measure of public control.

Which brought him to his second question. Who was to exercise that control? Was it to be the local authorities or the Minister working through the region? The local authorities, it was recognised, had behaved with patriotism in accepting the proposals of the white-paper, which must have been unpalatable to them. But he thought it only fair to say frankly that every discussion among consultants and specialists in the last few years had been dominated by one fear—that the hospitals would come under the control of the local authorities. Because the white-paper appeared to lift that menace from the profession many consultants were reconciled to the passing of the voluntary system. Why did doctors thus dread being put under local authorities? Among those who practised clinical medicine in their services Lord Moran had found a sense of frustration due to the fact that the doctor had little to say in their administration and to delay in getting things done. But it was true that doctors were working happily under some municipal administrations, such as the Middlesex and Surrey county councils, which proved that there was nothing inherent in the municipal system to make doctors discontented.

Thus far most consultants accepted the Minister's proposals; but when it was asked who was to exercise this control and whether it implied the transfer of ownership of hospitals agreement ceased; and here Lord Moran stressed that he spoke for himself alone and not for all his colleagues. One group thought that the Minister should give a block grant to the region to be used as sanctions to bring backward hospitals into line. Others, of whom he was one, believed that such a system would not work. He could not picture a region applying sanctions to a powerful local authority. The authority would immediately agitate for an alteration in the composition of the regional board, and the upshot would be a local-authority majority on the board, which was just what the profession wanted to avoid.

GAINS AND LOSSES

Change of ownership would bring the hospitals coördination, financial security, and freedom from the menace of the local authorities. Furthermore, the Minister had refused to blunt the growing edge of medicine, and the teaching hospitals were to be left alone. The non-teaching hospitals were to be put under a region with real power, the very thing the profession had sought in vain from the Minister's predecessor. We would lose the voluntary system; but here Lord Moran pointed out not every voluntary hospital was a centre of learning and nearly all the advances of the past had come from the teaching hospitals, the essence of the voluntary system, which were being preserved intact. Another gift of the voluntary hospital to the community was the local interest which it inspired. In the *Times* Sir William Goodenough and the secretaries of the King's Fund had suggested how local interest could be preserved within the fabric of the white-paper by giving local hospitals a larger measure of autonomy and some control over their own finances. Lord Moran hoped the Minister would consider these suggestions carefully, while not forgetting that the more the local management committee gained in power the less was the influence of the university. And after all, he affirmed, to spread the

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influence of the university through the country was the chief object in setting up the regions.

COMPOSITION OF REGIONAL BOARD

Nearly all the resolutions passed in favour of the white-paper ended "provided the composition of the regional boards is satisfactory," and Lord Moran stressed the importance of this proviso. The regional boards were to have great power. Not only would they say whether a hospital was to expand and add to its beds and departments, but they would also be able to take departments away. Lord Moran did not himself share the suspicion that having shut out the local authorities from the front door the Minister was going to let them in by the back door and give them control over these boards. He believed that the Minister had learned from the experience of the Nuffield Provincial Hospitals Trust that the only way to make such boards work was to handpick those who worked on them.

The Minister's proposals for pooling the endowments of non-teaching hospitals had been criticised, and though Lord Moran admitted that to him that implied some departure from the donors' intention, he did not think it merited the word "confiscation." If the Minister assumed responsibility for the debts and liabilities of these hospitals and for their maintenance, was it altogether reasonable that he should be deprived of their assets? Moreover, he believed the proposal had come not from the Ministry but from the medical side of the conference table.

GENERAL PRACTICE

It was difficult, Lord Moran suggested, to be sure what the general practitioner thought of the white-paper. Thousands of practitioners throughout the land never went near a meeting of any association. Then there were 17,000 doctors who had been serving with the Armed Forces: had that experience reconciled them to whole-time service or confirmed their doubts? Nevertheless he was satisfied that there was disquiet among practitioners for the future—a dread lest these proposals might lead to a whole-time service. After 25 years as dean of a medical school he confessed that he was unable to foretell what would be the effect of a whole-time service on the practice of medicine, and he could only envy the Minister his ready assurance, gained in the few hours he could spare from housing, that by turning a profession upside down he would necessarily provide a better service. One thing was clear, a whole-time service without adequate incentive would be a bad service. This the Minister had recognised by providing that those who worked at health centres would be paid in part by capitation fees.

But it was not only financial incentive that mattered; the work itself must be interesting and stimulating. In recent years the life of a general practitioner had lost something of its colour. The treatment of serious disease had passed out of his hands to hospitals. Presently, Lord Moran thought, we were almost certain to see a sharp division between consultants and general practitioners on the ground that if a man practises a specialty he should be trained for it. But this sharp division was going to take the milder degree of specialisation out of the general practitioner's hand and make his life still duller; and in medicine, if the pride of craftsmanship is lost, nothing is left. At present the doctor lived for work and lived laborious days. Would that be true in ten years' time? Would the conditions set forth in the white-paper attract the kind of man who had won the regard of the public? Lord Moran admitted he could not answer these questions, but they would determine, he concluded, "whether we are not merely doodling on scraps of paper which will be torn up by those who will come after, or whether we are working wisely for the betterment of the whole profession and for the good of the country."

OTHER SPEAKERS

In a maiden speech Lord INMAN, speaking as one who had been engaged in active hospital work for over thirty years, supported the establishment of a nation-wide all-embracing service. He saw no reason why voluntary support should not continue, for membership of the governing bodies of the teaching hospitals, of the regional boards, and of the management and house committees would still be unpaid and would offer plenty of opportunities for voluntary service.

Lord GEDDES feared that the procedure at health centres might disturb the confidence between doctor and patient, and proposed instead the provision of diagnostic centres where experts would do side-room work and laboratory investigations for general practitioners.

Lord PIERCY suggested that the security offered to the doctor under the new service could in a negative way be a form of incentive. It was possible that under the new conditions of service he might find his life more stimulating, longer, and more useful than he did as a private entrepreneur. Medicine, Lord Piercy added, was like religion: the layman was so deeply concerned in it that he could not with equanimity leave it entirely to the profession but must claim a say in it.

Lord LUKE ended an eloquent plea for the preservation of local interest and pride with a reminder that the voluntary hospitals had still to exist till 1948.

Lord HORDER, while supporting the motion as it stood, thought that Lord Moran had somewhat expanded its wording, notably in discussing the transfer of ownership of the hospitals to the Minister. During the past week, he continued, the Royal College of Surgeons and the Royal College of Obstetricians had dissociated themselves from any approval of this proposal. On the previous day the matter had also been discussed at a comitia of the Royal College of Physicians. He could not reveal the voting at this private meeting but he thought it was not without significance that Lord Moran had made no reference to the opinion of the college over which he presided. In conclusion Lord Horder quoted dicta lately published by the King's Fund, the British Hospitals Association, and the British Medical Association deprecating the transfer of ownership.

GOVERNMENT REPLY

The Earl of LISTOWEL, in replying for the Government, said that this was not the moment for a full statement of the Government case on a National Health Service, though this curtain-lifting debate would be of real value to the Government as an expression of informed opinion. He would, however, like to explain the exact position of the regional hospital boards. They were to administer all the hospitals, voluntary and public alike, with the exception of the teaching hospitals, in the separate regions. It would be a serious mistake for the Government to lay down their exact composition in advance, for their size and constitution must vary according to the needs of their areas. But the principle on which their members would be selected was clearly stated in the white-paper and the Bill. They would consist of people chosen for their individual suitability—those were the governing words—as experts with intimate knowledge and experience of hospitals, and not as delegates or even representatives of different and possibly conflicting interests in the area. Before making his choice the Minister was obliged to consult any university with a medical school in the region, and also representatives of the medical profession, the local health authorities, and, in setting up the original boards, those connected with the voluntary hospitals. The only rigid element in the board's composition would be the inclusion of at least two experts on mental health. The principle

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of individual suitability for each appointment, combined with the consultative machinery for making this principle effective, showed that the Government's intentions are to set up boards whose decisions will be shaped by a balanced and informed committee judgment based upon the experience and varied points of view of their members. In this way it was unlikely that any one element or interest would obtain a clear majority over the others.

Turning to the degree of independence of the hospital management committees, Lord Listowel said that the first object of the Government's proposals for the administration of the hospital was the maximum amount of devolution and local independence obtainable within the regional framework. Decentralisation was the goal, and no more central control was wanted than an efficient and coördinated service demanded. Both regional boards and management committees would have unfettered financial freedom within the limits of their annual budget. There would be no question of Treasury interference in the detailed allocation of their revenue. It was intended that the management committees should carry out the day-to-day running of the hospitals, a function that would neither be hampered by the regional authorities nor cut across the planning, coördination, and general supervision properly exercised by the regional boards.

The medical profession, Lord Listowel said, would not become the employees of local authorities; and the Medical Practices Committee would have no power to direct a doctor to a particular practice, though they could refuse him admittance as a practitioner to certain parts of the country. The committee would in fact be performing the functions of an appointments board, helping applicants to find suitable openings in the service.

CONCLUSION

In summing up, Lord MORAN reiterated that the crux of the whole matter was the regional board. If the board was good and trusted the whole thing would work, but if there was interference it would not work at all. He confessed himself an unrepentant advocate of health centres. After Lord Horder's reference to the comitia of the Royal College of Physicians he felt free to read the motion passed:

> that the College approves the central direction and coördination of the general policy of hospitals provided the composition of the Regional Boards is satisfactory.

Lord Moran added that the Consultant Service Committee had lately passed a motion of which Lord Horder did not approve. But he did not think they would get far by quoting against each other bodies that had done this or that. Was it not fair to say that opinion was much divided?

Status of R.A.M.C. in the New Army

Speaking in the debate on the Army Estimates in the House of Commons on April 15, Colonel M. STODDART-SCOTT said it would be inappropriate for him as a member of the R.A.M.C. for 20 years to speak of the achievements of the Corps, but he would like to refer to a few of its shortcomings. It was composed largely of officers, who were divided into professional men and administrators, and a curious factor was that if an officer became an administrator he must give up his clinical and professional activity. He (Stoddart-Scott) hoped that when the Corps was reorganised, promotion on the clinical and the administrative sides would go along parallel lines. At present a good surgeon or physician had to give up his clinical work to gain promotion; yet he did not necessarily become a good administrator. The R.A.M.C. was, he thought, the only technical service which was not able to provide the highest ranks in the Army. It was impossible for a R.A.M.C. officer to rise above the rank of director-general of the A.M.S. Until there was a system which would make it possible for such officers to become commanders of armies, or even field-marshals, the Government would not attract to the Corps such men as Moynihan, Horder, Moran, and Lister. A field-marshal's baton was said to be in the haversack of every soldier, but no field-marshal's baton had yet been found either in a surgical haversack or at the bottom of an Otway pit.

QUESTION TIME

General Medical Council

Sir HENRY MORRIS-JONES asked the Lord President of the Council whether, in view of a recent decision of the High Court, he would consider reviewing the present constitution and powers of the General Medical Council.

Dr. H. B. MORGAN asked the Lord President whether he would consider introducing legislation to amend and reform the Medical Act of 1898, so as to give the General Medical Council a more democratic constitution, and especially to make provision for the hearing and investigation of unethical or unlawful charges against registered medical practitioners by an independent tribunal presided over by a judge, or consider the setting up of a Select Committee to review the functions of the present General Medical Council and consider any changes necessary in its constitution and procedure.—Mr. CHUTER EDE, the Home Secretary, replied: I understand that the General Medical Council itself appointed a committee in November, 1944, to consider the consolidation and amendment of the Medical Acts. The whole position is being examined, and the possibility of legislation at a suitable opportunity will be kept in mind.

Sir H. MORRIS-JONES: While I make no reflection on the impartiality of this august body, is the Minister aware that there is grave doubt as to its competency to deal with the grave issues which it has to decide upon? Would the Minister inquire into the possibility of strengthening the general practitioner side over which class of doctor the council has virtually the power of ruin on the uncorroborated evidence of a neurotic woman?—Mr. EDE: I will pass on these observations to the Lord President of the Council.

Dr. H. B. MORGAN: Is it right that the General Medical Council, itself the body which needs reform, should be asked to reform itself? Is it not a matter that the Government should take up, so that doctors may get justice according to the law of the land?—Mr. EDE: I should have thought that self-reform was always a desirable occupation for anybody. But I will suggest to the Lord President of the Council that my hon. friend thinks that a little stimulus from outside might assist in the process. Mr. HECTOR HUGHES: Is it not wrong in principle that the General Medical Council should be allowed to be the judge in its own case, and wreck the careers of people on inadequate evidence?—Mr. EDE: The general powers of this body are, I understand, under review. Dr. MORGAN gave notice that he would raise the matter again on the motion for the adjournment as soon as possible.

Fit for Service, Fit for Pension

Mr. T. MACPHERSON asked the Minister of Pensions if he had considered the recent judgment given by Mr. Justice Denning in favour of an ex-Service man on the grounds of fit for service, fit for pension; and if he was now prepared to review similar cases which had been refused by his department.—Mr. W. PALING replied: In the judgment referred to, the learned judge expressed the view that the interpretation to be placed on article 4 of the Royal Warrant was that if a man is accepted for service in a certain medical category there is a presumption that at the time of his acceptance he was fit for the kind of service demanded of a man in that category; and that in the event of his discharge subsequently on medical grounds due to deterioration in his health there is a presumption that the deterioration was due to his service. He added that the presumption is not a compelling presumption but a provisional one. In order, however, to defeat the man's claim, the evidence had to show a real preponderance of probability that his condition was not aggravated by war service. In the case before him the learned judge held that there was no such evidence and that the tribunal could not properly come to a conclusion in favour of the Ministry. While there may at times be a difference of opinion as to what constitutes a real preponderance of probability I do not think that the general line of approach laid down by the learned judge differs materially from that followed by my department.

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Day Nurseries

Mrs. B. CASTLE asked the Minister of Health whether he had now received reports from local authorities of their plans for continuing the day nursery provision established in war-time; how many councils were closing nurseries; and how many were increasing the charges.—Mr. A. BEVAN replied: Schemes have been received from 256 of the 293 authorities which established day nurseries in war-time. These relate to 1116 war-time nurseries. Between them 69 authorities are proposing to close 97 of these nurseries. Increased charges are contemplated in about 13 areas, but my information under this head may not be complete, as authorities are not specifically required to notify their proposed charges.

Shortage of Nurses

Mr. J. MORRISON asked the Minister in which category of hospital, voluntary or municipal, the shortage of nurses was the greater.—Mr. BEVAN replied: The shortage of nurses is in general greater in the municipal hospitals, which include tuberculosis sanatoria and a large number of beds for the chronic sick.

Schools for Deaf Children

Replying to a question, Miss ELLEN WILKINSON said: There are 43 special schools for the deaf with accommodation for 4230 children in England and Wales, including 4 schools in London with accommodation for 246 children. There is some shortage of provision, particularly for young deaf children, in the south of England, and in deaf schools as in ordinary schools more teachers are needed. Before the war the provision of hearing-aids in these schools was proceeding rapidly, but this development was stopped by evacuation and difficulties of supply and maintenance during the war. Suitable apparatus is, at the moment, virtually unobtainable, but a committee of the Medical Research Council is investigating the whole problem. It is the practice of school medical officers and teachers to explain to parents the importance of giving a deaf child speech training from an early age. I have no definite evidence of an increase in the incidence of deafness among children, but I am glad to say that there appears to be a growing appreciation among parents of the importance of early diagnosis and treatment, and a consequent increase in the demand for special school education for the younger deaf children.

Obituary

JOHN ERNEST SULLIVAN FRAZER

D.SC. LOND., F.R.C.S.

J. E. S. Frazer was born 75 years ago. On leaving school, at Dulwich College, he became a student of St. Bartholomew's Hospital from which he qualified in 1891 at the early age of 21. His original intention was to become a surgeon, and he took his fellowship in 1895; but just about this time he became so ill with septicæmia from a postmortem wound that a surgical career appeared to be hopeless. It was then that he began in earnest the study of anatomy, and he became so much interested in it that he devoted the remainder of his life to its teaching and research. He became demonstrator of anatomy at St. George's Hospital and later worked with Peter Thomson at King's College where he was lecturer until he went, in 1911, to St. Mary's Hospital to become a professor of the University of London, of which he became also a doctor of science.

He was one of the greatest teachers of anatomy, his demonstrations being illustrated by the most elaborate yet informative drawings in coloured chalks at which he excelled. Indeed at one time he intended to follow art as a profession. It was very characteristic of him that he always insisted upon the surgical bearing of the facts he taught.

But he was not only distinguished as a teacher; he was one of our foremost embryologists, adding greatly to our knowledge and constructing a valuable collection of wax models of developing organs and embryos. Yet although this was his principal activity and he wrote a *Manual of Embryology*, he will be remembered chiefly for his *Anatomy of the Human Skeleton*. This work is unique. In it osteology was presented from a new aspect. It is remarkably interesting to read and abundantly illustrated by drawings done by himself. Lesser literary works were a *Practical Anatomy* (with R. H. Robbins) and a revision of Buchanan's *Anatomy*.

As a person Frazer was unusually attractive. He had a fine constitution and the equable temperament of a large man. In his youth he excelled as a hammer-thrower. For such a muscular man he was remarkably deft in carrying out fine laboratory manipulations. He was an ardent golfer, and a staunch Conservative, and possessed a rare sense of humour and a kindliness which endeared him to generations of students.

Nine years ago while actively prosecuting his researches he was struck down in his laboratory with an illness from which he never really recovered though he returned to work for a time. To those who worked with him he will always be remembered as a genial companion, a loyal friend, a man of character too big for petty spites and jealousies, and a wise adviser.

Medical Diary

APRIL 28 TO MAY 4

Monday, April 29th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Dr. L. W. Proger: Original Pathological Specimens from the Hunterian Collection. (Erasmus Wilson demonstration.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Odontology.* Prof. R. V. Bradlaw: Leaves from my Notebook—a talk on oral pathology.

Tuesday, 30th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Medicine.* Dr. Morton Gill: Treatment of Ulcerative Colitis with Intestinal Mucosa. Dr. Alec Wingfield: Observations on the Ætiology and Treatment of Sprue.

PADDINGTON MEDICAL SOCIETY
8.45 P.M. (St. Mary's Hospital, Paddington.) Dr. D. E. Bunbury: Recent Developments in Psychological Medicine.

Wednesday, May 1st

ROYAL COLLEGE OF SURGEONS
5 P.M. Dr. L. W. Proger: Original Pathological Specimens from the Hunterian Collection. (Erasmus Wilson demonstration.)

ROYAL SOCIETY OF MEDICINE
2.30 P.M. *History of Medicine.* Prof. S. Lyle Cummins: Phthisiologists of the 17th Century.
5 P.M. *Surgery.* (Westminster Hospital, S.W.1.) Cases will be shown at 3.30 P.M.

UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Dr. J. D. Fraser: Ocular Vitamin Deficiency.

Thursday, 2nd

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. T. M. Tyrrell: Inflammation and Repair in the Tissues of the Eye. (Erasmus Wilson demonstration.)

ROYAL SOCIETY OF MEDICINE
8 P.M. *Neurology.* (National Hospital, Queen Square, W.C.1.) Mr. Geoffrey Keynes, Dr. J. Carson, Dr. D. H. Collins: Surgical Treatment of Myasthenia Gravis, with demonstration of cases.

Friday, 3rd

ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Otology.* Mr. J. W. Cope, Miss M. R. Dix, Mr. C. S. Hallpike, Mr. R. B. Lumsden: Paper.
2.30 P.M. *Laryngology.* Mr. J. P. Stewart, Mr. R. B. Lumsden, Mr. W. Mackenzie: Rhinology in the Mediterranean and African Areas.
5.30 P.M. *Anæsthetics.* Short communications.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION
8.30 P.M. (B.M.A. House, Tavistock Square, W.C.1.) Dr. V. Mary Crosse: Care of the Premature Baby.

Saturday, 4th

BIOCHEMICAL SOCIETY
2 P.M. (Department of Biochemistry, University Museum, Oxford.) Papers and demonstration.

Appointments

CELLAN-JONES, C. J., M.D. Durh., F.R.C.S.E.: medical referee for the county-court districts of Bridgend, Neath, and Port Talbot (circuit no. 30), and of Cardigan, Carmarthen, Ammanford, Lampeter, Llandovery, Llanelly, Newcastle, Emlyn, and Swansea (circuit no. 31).

FORDYCE, A. B., M.B. Glasg.: medical referee for the sheriff-court district of Dunoon.

MILLER, J. A. W., M.B. Lond.: factory surgeon for Rugby.

MORRISON, HUGH, M.B. Edin.: M.O.H., Taunton rural, Wellington rural and urban districts; medical superintendent, Taunton Isolation Hospital; and M.O. for Somerset V.D. clinics.

SMITH, R. E. G., M.R.C.S.: factory surgeon for Nottingham East.

STRATFORD, M. G., M.B. Lond.: medical registrar, National Temperance Hospital, London.

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Notes and News

THE BILL SUMMARISED

Dr. W. Montague Levitt has prepared for the *British Encyclopædia of Medical Practice* a special interim supplement which sets out the proposals of the National Health Service Bill in relatively simple language. His aim has been to give a complete account of the proposals, but by rearranging the information and dispensing with parliamentary phraseology he has reduced his material to reasonable compass and has made it easier to understand. The supplement will be issued to all subscribers to the encyclopædia, but is also obtainable at 5*s.* (plus 6*d.* postage) from the publishers, Messrs. Butterworth & Co. Ltd., Bell Yard, Temple Bar, London, W.C.2.

Royal College of Surgeons of England

A quarterly meeting of the council was held on April 11 with Sir Alfred Webb-Johnson, the president, in the chair. The Walker prize of £100 was awarded to Prof. E. C. Dodds, F.R.C.P., F.R.S., for his work on the synthesis of stilbœstrol and dienœstrol, which has proved most valuable in the treatment of prostatic cancer. The John Hunter medal and triennial prize of £50 was awarded to Dr. Joan M. Ross for her outstanding work in pathological anatomy, particularly in regard to the collection of pathological specimens illustrating injuries and diseases occasioned by the war. The Begley prize for 1946 was awarded to Otto Fleischner of the University of Vienna.

Mr. W. Rowley Bristow was elected Robert Jones lecturer for 1946, and Surgeon Captain Lambert Rogers was re-elected a member of the court of examiners.

Dr. G. M. Vevers, superintendent of the Zoological Society of London, and Mr. A. J. Durden Smith, surgeon to Mount Vernon Hospital, being members of the college of 20 years' standing, were elected to the fellowship. Diplomas of membership were granted to John Cox, J. R. Hawkings, and Margaret H. Pond.

It was decided to hold special courses in anatomy, applied physiology, and pathology for the primary fellowship examination, beginning in September–October, 1946.

The subject for Jacksonian prize essays for 1947 will be the Surgery of the Lower Œsophagus and Cardiac End of the Stomach, and the subject for Cartwright prize essays for the 5 years ending 1950 will be the Healing of Injuries and Postoperative Lesions of the Jaws.

The following Erasmus Wilson demonstrations and Hunterian lectures will be delivered at the college during April and May, at 5 P.M. April 29 and May 1, Dr. L. W. Proger: Original Pathological Specimens from the Hunterian Collection. May 2, Mr. T. M. Tyrrell: Inflammation and Repair in the Tissues of the Eye. May 9, Mr. D. H. MacLeod: Endometriosis, a Surgical Problem. May 16, Mr. B. W. Rycroft: War Wounds of the Eye and their Treatment. May 23, Mr. J. Charnley: Conservative Treatment of Fractures of the Femoral Shaft. May 30, Mr. C. G. Rob: Diagnosis of Abdominal Trauma in Warfare.

University of Glasgow

At a graduation on April 13, the degree of M.D. with high commendation was conferred on J. B. Morrison.

Scottish Conjoint Board

The following have been admitted licentiates of the Royal Colleges of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow:

Yousef Anwar, Hugh Biggins, Max Bleicher, W. A. Brown, I. S. Bruce, A. M. Buchanan, James Caldwell, William Campbell, R. E. Dwork, Frank Fleming, Nicholas Katz, S. O. Krause, L. W. Kyrollos, Angus McDonald, Catherine McGuigan, R. D. G. MacLennan, I. H. Mathieson, Nicholas Meleca, Edith M. Muggoch, L. R. Orens, G. L. Park, F. R. Roberts, Caroline Y. B. Robertson, D. N. Rosenberg, Jack Rusius, Agnes E. Russell, Jaswinder Singh, J. W. Tandatnick, and T. G. Thomas.

Index of U.S. Scientific Books

The U.S. National Research Council on April 15 announced the publication of an index of scientific, medical, and technical books published in the United States from 1930 to 1944. Five thousand copies are being distributed to United States embassies, legations, and libraries throughout the world. All books listed are in print and are available for distribution, which is being handled by the United States International Book Association, New York. The volume contains a selected list of 6000 titles, with notes on the contents.

Voluntary Hospitals and the Health Service

Representatives of the London voluntary hospitals have adopted a resolution welcoming a National Health Service designed to coördinate the hospital services, but urging "the retention by the voluntary hospitals of their property and management, their entities and their traditions, since only thus in their view can the best interests of the community be served."

Refresher Courses in Tuberculosis

The Tuberculosis Educational Institute has arranged courses for medical practitioners and tuberculosis officers as follows: June 18–20 at Papworth Village Settlement; Sept. 23–28 at the London School of Hygiene and Tropical Medicine (on the treatment of tuberculosis); Nov. 4–8 at Newcastle-on-Tyne. Applications should be sent to Dr. Harley Williams, Tavistock House North, Tavistock Square, London, W.C.1.

Return to Practice

The Central Medical War Committee announces that Dr. R. R. Bomford, F.R.C.P., the Private Wards, London Hospital, E.1, and Dr. H. V. Dicks, 30A, Wimpole Street, W.1 (Welbeck 8775), have resumed civilian practice.

Births, Marriages, and Deaths

BIRTHS

BEYNON.—On April 7, the wife of Dr. John Beynon, of Brighton—a son.
BLACK.—On March 29, at Cork, Dr. Florence Black (née Murphy), wife of Dr. Thomas Black—a daughter.
BLAINE.—On April 13, in London, the wife of Dr. George Blaine—a son.
DAVIES.—On April 22, the wife of Dr. L. Picton Davies—a daughter.
FRAZER.—On April 19, the wife of Prof. A. C. Frazer, M.D.—a son.
GIBSON.—On April 13, at Ipswich, the wife of Dr. R. V. Gibson—a son.
GRANT.—On April 15, the wife of Dr. C. L. Grant, of Chislehurst, Kent—a daughter.
LITTLEDALE.—On April 14, at Ashford, the wife of Dr. R. M. Littledale—a son.
OFFORD.—On April 12, the wife of Dr. H. E. Offord, of Redhill—a son.
POOLEY.—On April 11, at Isleworth, the wife of Captain J. M. B. Pooley, R.A.M.C.—a daughter.
WALFORD.—On March 29, at Tunbridge Wells, the wife of Dr. P. A. Walford—a daughter.

MARRIAGES

CONNOLLY—FLATHER.—On April 5, in London, Neville Kingsley Connolly, M.D., to Agnes Haskell Flather.
MACKENZIE—CAVE.—On April 18, at Keswick, John Mackenzie to E. P. D. Cave.
SHUBIK—ROGERS.—On March 20, at Poona, Philippe Shubik, major R.A.M.C., to Nancy Rogers, major I.M.S.

DEATHS

BENT.—On April 12, at Lingfield, Percy Claude Vincent Bent, M.R.C.S.
BRIDGES.—On April 17, at Harcourt Terrace, S.W.10, Ernest Chittenden Bridges, M.D. Durh., formerly of Ashburn Place, S.W.7, aged 76.
CONYNGHAM.—On April 16, Henry Francis Conyngham, L.R.C.P.I., formerly of British North Borneo.
CROWE.—On April 22, at Nottingham, Charles Leask Crawford Crowe, M.D. Aberd., medical superintendent, City Hospital, Nottingham.
DODD.—On April 21, in London, Stanley Dodd, M.B. Camb., F.R.C.P., F.R.C.S.E., F.R.C.O.G., aged 70.
FRAZER.—On April 15, in London, John Ernest Sullivan Frazer, D.SC. Lond., F.R.C.S.
HOTCHKIS.—On April 16, at St. Andrews, Robert Dunmore Hotchkis, M.D. Durh., formerly medical superintendent, Dykebar Mental Hospital, aged 78.
JACKSON.—On April 15, at Cross Keys, near Taunton, William Roy Jackson, M.A. St. And., M.D. Edin., aged 77.
JAMES.—On April 17, Sydney Price James, C.M.G., M.D. Lond., F.R.S., lieut.-colonel I.M.S. retd.
MURPHY.—On April 7, at Aden, Philip Paine Murphy, M.B. Dubl.
O'DONNELL.—On April 14, at Putney, Dermot Rodney O'Donnell, M.B. N.U.I., aged 36.
STILES.—On April 19, at Gullane, East Lothian, Harold Jalland Stiles, KT., K.B.E., LL.D., M.B. Edin., F.R.C.S.E., aged 83.
WILLIAMS.—On April 20, John Morell Williams, M.R.C.S., surgeon lieutenant R.N.V.R.

THE INDEX and title-page to Vol. II, 1945, which was completed with THE LANCET of Dec. 29, is published with our present issue. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

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CHOLERA EPIDEMIC AMONG PRISONERS-OF-WAR IN SIAM

H. E. DE WARDENER
M.B. Lond.
CAPTAIN R.A.M.C.

FOUR months after the capitulation of Singapore in February, 1942, the Japanese began sending prisoners-of-war (P.O.W.) to Siam. This movement continued for the next year. Before leaving Singapore nearly all the troops had had some degree of deficiency disease, mainly hyporiboflavinosis and beriberi, and many had had bacillary dysentery. In Siam prisoners were divided into several groups and employed on building a railway between Siam and Burma. This is an account of a cholera epidemic in group II.

After completing the first part of the railway on the Siamese side, group II (including many of its sick) moved up country early in 1943, marching along a rough dirt road built alongside the railway tracing. Impressed coolies from Malaya and the Dutch East Indies and 10,000 P.O.W.'S sent as reinforcements from Singapore were also on their way up country at the same time. The Singapore contingent were nearly all sick and had been left to the very last by our own authorities in the hope that they would miss the trip and harder work involved in going to Siam. Finally, apart from the railway labour force, Japanese reinforcements for Burma were also on their way along the same road. Transit camps were shared by the railway working force and might have P.O.W.'S in them one night and coolies the next. The camps, immediately after the coolies had passed through, were filthy; and, after the cholera epidemic had started in May, 1943, it was not unusual to find one or two corpses left behind from the previous party.

The railway tracing in Siam followed the course of a river; and, though the cholera epidemic was widespread up and down this river, the Japanese at no time stopped the flow of men going up river.

CAMP AND ACCOMMODATION

The camp, situated at the 205-km. mark, was placed between the river and the railway tracing. Jungle clearing was unfinished, and the ground was covered with bamboo stumps and bushes. Tents were provided for accommodation, holding 20–25 men each though intended for only 6–8; many were not waterproof, and some consisted of only one fly; 75% of the men were placed in these tents, the remainder making bivouacs and bamboo shelters. Monsoon weather started during the second week in May and continued for the following four months, turning the ground into a quagmire. Latrines (shallow trench) were totally inadequate, and fouling of the ground all over the camp was very prevalent both before and after the onset of the epidemic. It was not until the onset of the epidemic that the Japanese would permit any men to dig deep trench latrines; up to that time all available men were employed on the railway.

Work on the railway started the day after arrival in camp. The men got up before dawn, had their breakfast in the dark, and at dawn would start work, which usually continued until dark. Food at this time consisted of rice, dried fish, and dried vegetables. There was no canteen, though for a few days before the onset of the epidemic a limited number of eggs were available.

TROOPS CONCERNED

At the onset of the epidemic there were 1600 British and 250 Dutch troops in camp. The Dutch, mainly Eurasians, had been left behind from a small party of 500 who had occupied the camp before us. They were all sick, many of them seriously, with dysentery, diarrhœa, malaria, and deficiencies. They were not segregated in any way, their area being between the British lines and the British cholera hospital. British cholera cases had to be carried through the Dutch lines to hospital. None of the Dutch were admitted to the British hospital, the whole Dutch area being administered by Dutch doctors as a Dutch hospital area. They had the same food as the rest of the camp, and their sanitation, owing to the high concentration of sick in a small area, was worse than ours.

"HOSPITAL" FACILITIES AT ONSET

The term "hospital" is not to be misunderstood. It was a name given to that part of the camp in which the most serious sick were placed. It differed in no way from the rest of the camp as regards accommodation and food. It was, however, administered by R.A.M.C. personnel and thus enjoyed a partial immunity from the Japanese. The equipment was rudimentary and drugs were almost non-existent. There was no microscope or laboratory equipment of any kind. The hospital company consisted of approximately 60 orderlies and 7 medical officers. Sickness among the whole company was high. One M.O. was S.M.O. of the camp, and of the six remaining there was always an average of three "bed-down," and at one time during the epidemic there remained only one fit. At the onset of the epidemic there were four tents for the sick: one each for malaria, dysentery, diphtheria, and one for surgical and general medical cases. Only very serious cases were admitted, as the facilities were totally inadequate for the number of hospital patients in camp.

PREVENTIVE TREATMENT BEFORE ONSET

For a few months before the outbreak there had been rumours of cholera up-river, and cholera inoculations had been given. The Dutch in the camp had been inoculated just under four weeks before the onset. At different times all British troops were supposed to have been inoculated, the most recent being six weeks before the onset. It is pretty certain, however, that owing to the usual Japanese incompetence small batches of men were not inoculated, and many, owing to insufficient vaccine, were only given one dose of 0·75 c.cm. instead of the usual 1·5 c.cm. given in two doses (0·5 c.cm. and 1·0 c.cm.). Lieutenant Isikai, O.C. of a Japanese mobile cholera laboratory, stated that the immunity given by the Japanese vaccine was not above four weeks.

At the beginning of May the Japanese reported an outbreak of cholera in a Tamil camp 20 km. up-river. As a result, bathing in the river was prohibited by the Japanese; but this order was not strictly obeyed, as there were no other facilities for washing. Several men were seen drinking untreated river water up to and including the day before the onset. During this time there was no cholera vaccine issued by the Japanese, though the inoculation of British troops was overdue.

OUTBREAK AND PROGRESS OF EPIDEMIC

The date of onset of the epidemic is uncertain and was not clearly recognised, owing to the inexperience of the medical officers in the diagnosis of cholera. Before and concurrently with the onset of the epidemic there were many cases of dysentery and diarrhœa, with several deaths from dysentery. On May 16 a patient was admitted to hospital with a diagnosis of cholera, but this diagnosis was not supported by the medical officers of the hospital. This patient survived, but in retrospect it appears that the original diagnosis of cholera was correct. The patient's symptoms corresponded closely with those of later definite cases, and a rectal smear ten days after admission was positive. This case was not notified to the Japanese. On May 22 another case was admitted with a diagnosis of cholera. The subsequent rapid course of this patient's symptoms confirmed the diagnosis, and the Japanese were notified on the same day. Though this patient died two days later, the

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Japanese refused to recognise the case as one of cholera. On May 23 nine more cases were admitted, and the cholera epidemic had unmistakably started.

The course of the epidemic can be seen in the figure. A 5-day cycle between four consecutive peaks of admission is worthy of note. Two phases of the epidemic can be seen: the first and main portion of the epidemic lasting a month; and a small flare-up at the end of July and August in the "fit camp," a separate small camp adjoining the main area. Whereas the P.O.W. in the main camp were receiving 1 c.cm. of cholera vaccine a month from the beginning of the epidemic, those in the smaller camp had received an initial 1 c.cm. and subsequently only 0·5 c.cm. a month.

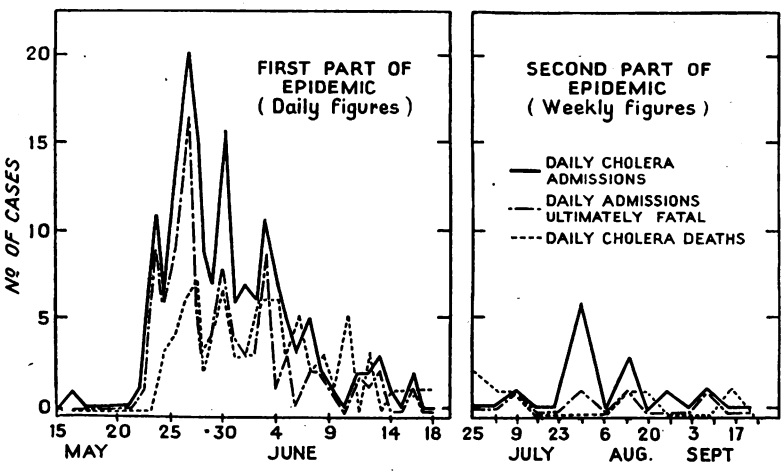
During the epidemic only one officer out of a total of 200 developed the disease. Because of this, percentages of deaths and incidence have been calculated under three headings: (1) total British troops; (2) British other ranks; and (3) officers. This remarkable disproportion was tentatively explained by the better general condition of the officers, their more intelligent adherence to preventive measures, and the fact that all officers were in tents. There was a strong impression that there was a higher figure of cholera incidence, proportionately if not absolutely, among troops in bivouacs and shelters than among those in tents. The figures are as follows:

British officers in camp	200
British other ranks in camp	1400
Cases of cholera admitted	173
Deaths from cholera	100
Deaths per admission	57·8%
Cases of cholera in total British troops	10·8%
Cases of cholera in British other ranks	12·3%
Deaths in total British troops	6·3%
Deaths in British other ranks	7·1%
Cases and deaths in British officers	0·5%

Only cases notified as cholera have been included in the incidence figures. Some patients were admitted for observation with diarrhœa and vomiting; but, unless there was definite evidence of dehydration and/or collapse, they were not notified as having cholera. Excluding the figure of incidence and deaths for the officers, all other figures are accurate only to within 3%. This was due to the difficulty in differentiating, from the records, cases of cholera occurring in the camp from cases admitted from other camps.

The 100 deaths shown are those due directly to cholera and to its immediate complications, such as uræmia. Deaths from other causes—e.g., beriberi, pellagra, &c.—after recovery from cholera have not been included.

Among the 250 sick Dutch troops in the camp there was only one case of cholera. It occurred in the middle of June at the end of the main portion of the epidemic, was not fatal, and has not been included in the graph figures. This immunity among the Dutch was observed by British, Dutch, and Australian doctors in all the camps on the river. Though they were subject to dysentery and deficiencies to the same extent as the British, the incidence of cholera among the Dutch troops was negligible. The Dutch doctors ascribed this immunity to the yearly cholera inoculations given to all Dutch troops in Java. Though in our camp the Dutch were the only ones to be inoculated within four weeks of the epidemic, this distinction between British and Dutch did not apply in other camps.



CLINICAL PICTURE

The classical description divides the disease into three stages: that of diarrhœa, the algid, and the reactive. The signs and symptoms which are described here as "early" include all the changes which took place during the stage of diarrhœa and on which a diagnosis of cholera was usually made. The algid and reactive stages are considered as late phenomena.

Early Signs and Symptoms.—The most usual time of onset was at night, especially in the two or three hours before dawn. A great many patients had had chronic diarrhœa or dysentery before the onset of cholera. Others developed diarrhœa for the first time in the camp. This would last up to two or three days and then be followed by typical cholera. One officer with constipation, and not sufficiently grateful, took a dose of salts and developed cholera within twenty-four hours. As this officer was admitted from another camp, he has not been included in the incidence figures. Finally, some patients developed cholera without previous diarrhœa.

The first sign of cholera was a sudden onset of diarrhœa or a change in the type of diarrhœa, which became slightly more frequent, watery, colourless, and copious. The evacuations were separated by intervals of an hour or more and were often followed by a sense of relief. According to the severity of the attack, vomiting would follow a few hours later; it was rarely frequent, but was remarkable for its lack of effort. Pints of fluid gushed out from a patient's mouth without any straining or apparent distress. I was once questioning a patient suspected of cholera who was standing up apparently fit and resenting the imputation. Up to that time he had had only one rather loose and copious motion. As he was talking he suddenly turned his head aside, brought up two pints of clear fluid, and resumed the conversation as if nothing had happened. Within two hours he was in the algid stage.

By the time patients were admitted to hospital they presented the following picture. They would complain of deafness, gradually becoming more marked. The voice was faint and hoarse. Some men complained of dimness of vision, amounting in one case to blindness except for the appreciation of light and dark. Limb cramps were rare before admission, but a feeling of stiffness was common. On examination the apathy of the patient was the most striking feature. Other signs included a soft compressible pulse, sunken darkly ringed eyes, and the "washerwomen" appearance of the fingers. Limb muscles felt resistant and firm, and the skin cold and clammy.

Late Signs and Symptoms.—After the early stage the patient would pass into the algid stage, chiefly characterised by cyanosis and restlessness. Restlessness was especially noticeable, as one of the few things that could be done for patients was to keep them warm. This was continually being frustrated by patients in the algid stage. Though cold and clammy to the touch, they behaved as if they were too hot, throwing off their blanket

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and rolling about on the ground. They also had a great disinclination to drink water in adequate amounts, though complaining of thirst. Abdominal and limb cramps during this stage were very common, and this would often make the patient cry out. A blue-grey face, contorted with pain, was a frequent and distressing feature. Diarrhœa and vomiting in this stage were not severe and on the whole inclined to disappear. Most fatal cases ended during this period. In the fulminating cases which occurred at the onset of the epidemic loss of fluids from diarrhœa and vomiting was *not* the main factor. Some men who had lost little fluid were among the first to become cyanosed, shrunken, and pulseless, and to die.

If the patient passed this stage, the length of his convalescence depended almost entirely on the length of time he had remained algid. The change-over to the reaction stage was sometimes very abrupt and clearly defined. The patient would turn from blue to pink, his face appeared to fill out, his pulse return, and his eyes become bloodshot. The sunken appearance of the eyes, however, continued and took many days to disappear. When this stage was reached there was a good chance of recovery.

COMPLICATIONS AND SEQUELÆ

The most common immediate complications were (1) coma due to uræmia, typhoidal state, or cerebral malaria; (2) cutaneous gangrene; (3) multiple abscesses; (4) severe anorexia leading to a quick onset of deficiency disease; and (5) residual diarrhœa.

(1) *Coma* was at first a difficult problem in differential diagnosis. Uræmic coma came on some days after the reaction stage and could be foreseen by the patient's anuria. In some cases, however, the onset might be delayed. Two men who had made apparent recovery and were passing urine in what appeared to be adequate amounts developed uræmia three weeks after the reaction stage. A few men with anuria and coma recovered, though it was commonly fatal. The typhoid state with fever came on at the same time as the reaction stage and lasted 3–4 days. There were only three of these cases, two of them fatal, death taking place in under a week. Cerebral malaria is included because it was very prevalent during the epidemic and had to be kept in mind constantly in differential diagnosis. As there was no microscope in the camp, the diagnosis was made entirely on clinical grounds. The onset of cerebral coma was usually associated with neck rigidity and spasticity of the limbs, this type of cerebral malaria being the most common at that time. A rise of temperature was of little value in diagnosis, and an enlarged spleen was almost universal throughout the camp.

(2) *Gangrene of the skin* was always a fatal sign. It developed in patients who had passed into the reactive stage after a prolonged algid stage. Large, painless, black, and rapidly growing areas appeared at all pressure-points, mainly across the sacrum and upper back. In twenty-four hours an area might be formed 3–4 in. in diameter. After two or three days the gangrenous areas would begin to separate. In a few cases the whole patch would slough, but the patient always died before epithelialisation. The pain attending the separation of the slough, the huge raw weeping areas which followed, the inadequacy of dressings, of nursing, and of comfort, all combined rapidly to exhaust the patient. In others there was no reaction; the gangrenous areas remained, becoming more extensive until death. Skin gangrene was most marked in patients who had been debilitated by chronic dysentery or beriberi before their attack of cholera, but was by no means confined to them.

(3) *Multiple abscesses* were seen in one or two cases, and again developed in those patients who had had a prolonged algid stage. The abscesses showed little reaction, as shown by redness or œdema, and the pain was less than one would have expected. In one case there was a large fluctuating abscess on the back, deep to the scapula and latissimus dorsi. It extended from the fifth thoracic to the first lumbar vertebra. The overlying tissues showed no redness or œdema, and the patient had very little pain. When incised the abscess cavity was found to contain a pint of pus.

(4) *Severe anorexia* after cholera was very common. It was thought to be due to the following reasons—

(*a*) The severe disease process which the alimentary tract had just suffered.
(*b*) The diet before the onset of the patient's cholera had been one which produced a state verging on beriberi. Any severe illness was apt to tip the scale, with anorexia as the first sign of B_1 deficiency.
(*c*) The natural dislike of a convalescent for plain rice lying unattractively in the bottom of a rusty mess tin.
(*d*) Chronic malaria, which was almost 100% prevalent.

(5) *Residual diarrhœa* was a troublesome complaint, most often due to an underlying amœbic or chronic bacillary dysentery infection reawakened by the cholera.

Finally, malaria, dysentery, beriberi, hyporiboflavinosis, and pellagra were common sequelæ after recovery from cholera. Few men who had had a moderately severe attack of cholera recovered their previous health and resistance; and, long after the cholera ward had been closed, fatalities from these continued among old cholera patients.

PREVENTIVE TREATMENT AFTER ONSET

The first step taken by the Japanese was to build a bamboo fence between the Japanese lines and the rest of the camp. Further measures ordered by the Japanese were afterwards taken: the camp was closed and isolated, work was stopped on the railway, and instructions were issued regarding food and water. All frying was abolished, and eggs were not allowed in the camp. Frying was considered dangerous owing to the exposure of the food between cooking and eating. Drinking-water had to be boiled instead of chlorinated, and washing in the river was not allowed. However, washing in river water continued, there being no alternative. After three weeks bleaching powder was issued in sufficient quantity for treating the river water for washing. On May 26, four days after the first official notification of cholera in the camp, an inoculation of just under 1 c.cm. of cholera vaccine was given to all troops. This was subsequently repeated at monthly intervals.

The hospital area was placed in isolation, and only cholera patients were admitted. Non-cholera patients already in hospital were segregated in the area as much as possible. During the first three weeks bodies were cremated, after this they were buried, as no men were allowed for the collection of wood. Work on the railway was resumed ten days after the onset of the epidemic.

Contacts were isolated by tents, remained in the main camp area, and were not allowed to work on the railway. Their isolation continued until one rectal smear culture had been taken. If this was positive, the man was admitted to hospital as a carrier; if negative, the isolation period was ended. At the suggestion of the British authorities a separate camp was built 200 yards up the river for men who had had one negative test and were fit for work. This camp was euphemistically named the "fit camp," and at its maximum held 500 men. During the major phase of the epidemic only one new case of cholera was admitted from this camp. However, it was responsible for all cases in the second phase of the epidemic.

All bacteriological examinations were undertaken by the Japanese. The first tests were made on May 23, on what appeared to be blood-agar plates. Two of these were positive out of a total of thirty. Over 70% of the patients on whom the tests were performed died before

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the results were known. A week later the whole cholera ward was tested on the same medium, and all were negative. Two days later the tests were repeated with a peptone medium. This was more successful, a few positives being found. The whole technique seemed very amateurish. Cultures from recently passed stools were never made; instead, the culture mediums were inoculated with a glass rod (or a piece of bamboo) which had previously been inserted into the anal canal and lower rectum. At no time was a systematic attempt made to make cultures from all fresh cases of cholera. Tests were made at most irregular intervals, varying up to a month, and bore no relation to the clinical demands of the epidemic.

TREATMENT

Facilities for treatment were totally lacking, and the difficulty was increased by the weather. The monsoons had begun a week before the onset of the epidemic. For some days at a time it rained heavily and incessantly, both day and night. The cholera tents were on the side of a ravine whose slope was approximately 1 in 2. Though flat spaces had been dug in the side of the hill for the tents, it was nearly impossible to build permanent paths up the slope and by the sides of the tents. Inside the tents there were pools of water and the ground was sodden. Most of the tents leaked badly. There was not enough lighting material to provide a lamp for each tent, and the resulting confusion in the darkness among helpless patients was appalling. There was an average of 15 patients in each tent, in a space 16 × 12 ft. and about 6 ft. high in the centre.

Nursing under these conditions consisted mainly in emptying bedpans, covering and digging up gross soil contamination, and removing and preparing the dead for burial. The number of orderlies during the day was never more than one to a tent, and at night one for every two tents. Sickness, cooking, fetching wood, sanitary duties, and clerks for records and returns accounted for the remainder.

There were no blankets or groundsheets for distribution in the hospital. Many patients had none of their own or, if they had one, did not have the other. As would be expected, fatalities seemed to occur more commonly in those with no groundsheets. Raised bamboo platforms were eventually made for all tents, but these were not completed until the fourth week of the epidemic. Before coming to the camp the hospital had bought several round enamel chamber-pots, and there were enough of these to supply each tent with one. Fæces and vomit were emptied into a so-called flyproof pit. To empty a chamber-pot at night was a hazardous procedure employing up to three orderlies: one to carry a light, the second to carry the bedpan (which necessitated the use of both hands), and one to help the second. There were accidents, and on three occasions the orderly carrying the pan slipped into the pit.

Treatment of the cholera consisted in giving as much drinking-water as possible. Even this was difficult, as there were not enough containers in which to boil water. Not more than three full water-bottles could be provided each day for the more severe cases. Pot. permang. crystals were at first given hourly but later discontinued owing to the nausea and vomiting so induced. An attempt was made to provide saline via the peritoneum; the saline was prepared from boiled river-water, crudely filtered, and the salt used was ordinary rock salt. It was found that only 4–5 pints could be given in a day. At best this produced slight abdominal discomfort and sometimes amelioration of symptoms. However, at least half the patients developed violent abdominal cramps immediately after the infusion, and this form of treatment was stopped. Morphine was used in many cases mainly as a humanitarian measure. Camphor in oil was available in limited quantities. During the epidemic the following medical supplies were given by the Japanese for cholera treatment: 5 litres of sterile saline solution; several dozen ampoules of camphor in oil, and 1 litre of concentrated essential oils mixture (not produced until the third week of the epidemic). In the fifth week of the epidemic the O.C. of the 'mobile cholera laboratory placed a still at the disposal of two R.A.F. medical officers attached to his laboratory. From then on there were adequate amounts of intravenous saline for the sporadic cases admitted.

SUMMARY AND CONCLUSIONS

In an epidemic of cholera among British prisoners-of-war in a Japanese camp in Siam the most instructive points were as follows:—

The fall in blood-pressure, rather than the actual loss of fluid from the body, was the more important factor in causing death and complications.

A prolonged algid state was of bad prognostic significance. This is in keeping with the main pathology of cholera, which produces a severe generalised anoxæmia. This so devitalises the tissues that even in patients who recover from the algid state convalescence is long and hazardous.

The apparent value of inoculations is supported by (*a*) the almost complete immunity of the repeatedly inoculated Dutch, although they were subjected to the same predisposing conditions and open to the same risk of infection; (*b*) the low incidence, there being only 173 cases of cholera among 1600 British in a closed overcrowded debilitated community with rudimentary sanitation; (*c*) the case-mortality of 57·8%, which under these unfavourable conditions and with no treatment was no higher than that recorded in previous epidemics (average about 50–60%).

Most of the men had received their first dose of 1 c.cm. of vaccine approximately two months before the outbreak; all received 1 c.cm. four days after its onset and 0·5–1 c.cm. monthly subsequently. Though preventive measures were taken, conditions were such that they could not possibly have prevented all exposures to infection.

THYROTOXICOSIS TREATED WITH THIOURACIL AND METHYL THIOURACIL

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SINCE the first publication by Astwood (1943) on the treatment of thyrotoxicosis with thiouracil many confirmatory reports have appeared both in America and in this country. My present purpose is to report the results of treatment with thiouracil and 4-methyl thiouracil in 70 cases of thyrotoxicosis, 65 of which presented typical signs and symptoms of hyperthyroidism, which had existed for periods of from two months to eleven years; the other 5 cases were diagnosed as anxiety neurosis associated with the signs and symptoms of mild hyperthyroidism. Of the former group, 50 had not received treatment with iodine during the preceding six months and had nodular or diffuse thyroid enlargement; 5 had previously been treated by subtotal thyroidectomy or deep X-ray therapy and had recurrence of signs and symptoms; 4 had received iodine medication within four weeks of thiouracil therapy; and 6 had also auricular fibrillation. The patients were observed for a week before treatment was begun, the observations being based on the daily records of waking and sleeping pulse-rate, body-weight, and periodic determinations of serum-cholesterol values. Owing to technical difficulties it was not possible to follow basal metabolic rates in all the patients.

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TREATMENT

Forty patients were treated with thiouracil, and 30 with 4-methyl thiouracil. In the first 10 patients treated with thiouracil, doses of 1·0–1·8 g. a day were used, but this system of dosage was later revised. Thereafter, an initial dose of 0·2 g. was given to test for any serious immediate reactions. After this a daily total of 0·6–1·0 g. was given in subdivided doses of 0·2 g. until there was a definite gain in body-weight. A maintenance dose was then continued which varied between 0·025 and 0·2 g. daily.

During the first two weeks of treatment white-cell counts were done on an average twice a week; and, when the maintenance dose was reached, the patients were discharged with instructions to attend at the outpatients' department every three weeks during the next four months. White-cell counts were made at each visit. After four months' maintenance treatment the patients reported at intervals of 8–10 weeks.

In assessing the therapeutic value of these antithyroid substances particular attention was paid to delay in response to treatment, danger of producing thyroid hyperplasia, toxic effects of the drug, and advisability of continuing maintenance therapy.

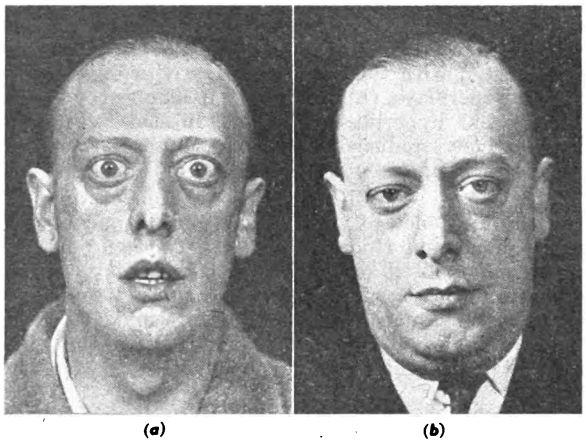
RESULTS OF TREATMENT

It is now known that there is a time lag between the start of treatment and the abatement of signs and symptoms, since the antithyroid substances do not inhibit the action of thyroxine but exert their main effect by preventing the formation of the hormone. Table I shows the approximate times at which the signs and symptoms disappeared after treatment was begun. The order of disappearance of the signs is in agreement with observations already made by other investigators. On the whole there is a more rapid control of thyrotoxicosis by methyl thiouracil than by thiouracil. In the 4 patients who had recently received iodine and were treated with thiouracil a considerable increase in the time lag was observed. This is to be expected, as thiouracil competes with the precursors of thyroxine for iodine, and is in keeping with the experiences already published.

TABLE I—RELIEF OF SIGNS AND SYMPTOMS IN DAYS AFTER START OF TREATMENT

Signs and symptoms	Thiouracil	Methyl thiouracil	Thiouracil following recent iodine
Subjective improvement; restlessness relieved ..	4–8	3–5	14
Sweating and skin flush controlled	6–14	4–7	20
Tremor diminished	10–20	5–12	30
Gain in body-weight ..	10–25	7–15	24
Tachycardia controlled ..	15–30	9–17	30
Serum-cholesterol increased	10–20	6–12	25

Auricular Fibrillation.—In table II are indicated the number of days and the total dose of thiouracil administered before normal sinus rhythm was established. There is some indication that the more recent the onset of auricular fibrillation the more rapidly it is controlled. Three patients (cases 4, 5, and 6) had received treatment with iodine within three weeks of beginning thiouracil therapy, and the effect of iodine in delaying response to treatment with thiouracil is again clearly evident. Case 6 was the first to be treated with thiouracil, and after 38 days' treatment it was decided to perform subtotal thyroidectomy; 26 days after operation there was still auricular fibrillation, but after a short course of quinidine the heart reverted to normal rhythm.



(a) (b)

Fig. 1—Case 13 (table IV): *(a) Before treatment*: aged 33; history: asthenia, nervousness, loss of weight (42 lb.) 10 months; skin flushed and sweating, well-marked tremor of hands, exophthalmos; slight diffuse enlargement of thyroid; pulse-rate 120 per min.; normal rhythm; blood-pressure 162/92; serum-cholesterol 90 mg. per 100 c.cm. *(b) 54 days after treatment* with thiouracil 30·2 g.: skin normal, no tremor, exophthalmos reduced, weight increased from 10 st. 13 lb. to 13 st. 7 lb.; pulse-rate 88 per min.; serum-cholesterol 185 mg. per 100 c.cm.; employed as heavy steel worker; maintenance dose 0·2 g. of thiouracil daily.

Cases 2 and 5 did not continue maintenance therapy and absented themselves for three and six months respectively, by which time signs and symptoms had recurred. In each case the heart-rate, though increased, was of normal sinus rhythm. In view of results already published (Dunlop 1945, Nussey 1944, Grainger et al. 1945, Cookson 1945) it can be assumed that thiouracil provides a reasonable prospect of effectively controlling auricular fibrillation associated with thyrotoxicosis.

Exophthalmos.—In a few patients exophthalmos was considerably reduced. This happened where the history was recent and other signs and symptoms were readily controlled (fig. 1). There was no material change in patients with a long history of goitre and exophthalmos.

Changes in the Thyroid.—In no case where the thyroid before treatment was enlarged was there any reduction in size as a result of treatment with thiouracil. In women it was observed that the gland underwent periodic fluctuation in size, which is no doubt related, as suggested by Dunlop (1945), to phases in the menstrual cycle.

Thyroid hyperplasia was produced in 6 of the first patients treated with thiouracil, probably owing to excessive dosage, with resultant stimulation of thyrotropic hormone. In these patients a slightly higher dose (1·2–1·4 g. a day) was used and was continued longer than in cases treated later; the enlargement persisted despite withdrawal of the thiouracil, and 4 of the cases underwent subtotal thyroidectomy. In the 2 remaining patients thiouracil was continued on a maintenance level of 0·1 g. a day, with full control of signs and symptoms but no change in the size of the goitre. There was no evidence of thyroid hyperplasia in any of the

TABLE II—CONTROL OF AURICULAR FIBRILLATION WITH THIOURACIL

Case	Days before restoration of sinus rhythm	Total dose (g.)	Duration of thyrotoxicosis (months)	Recent iodine medication
1	12	12·0	2	None
2	24	19·2	6	None
3	37	19·2	7	None
4	30	26·4	2	3 weeks
5	41	43·8	24	3 weeks
6	38 + +	37·4	6	3 weeks

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patients treated with methyl thiouracil; this may be due to the smaller doses used. Experimental evidence suggests that doses similar to those used in the earlier cases treated with thiouracil might produce comparable thyroid hyperplasia (Bavin 1944). It has been suggested that thyroid hyperplasia produced in this way might be effectively reduced by small doses of thyroid. Observations on this point are being continued.

Toxic Effects.—With the introduction of any new drug the incidence of toxic effects often appears to be unduly high, and thiouracil is no exception. As Leys (1945) has pointed out, there is a tendency to overemphasise the toxicity of the antithyroid substances in a manner similar to that which attended the introduction of the sulphonamides. Indeed, in the minds of some people thiouracil means "death to the white cell." There is little evidence, when the literature is carefully reviewed, of any serious danger of leucopenia, although several cases of agranulocytosis have been reported (Himsworth 1944, Newcomb and Deane 1944, Dunlop 1945, Grainger et al. 1945, Williams and Clute 1945). In table III are recorded the toxic effects noted in the 40 patients treated with thiouracil, and the 30 patients treated with methyl thiouracil. In 2 patients in the former series the white-cell count fell to 2500 and 3000 per c.mm. respectively during the first two weeks' treatment, when doses of 0·8 and 1·0 g. respectively were given. In each instance the dose was reduced to 0·2 g., and after five days, with a return of the white-cell count to about 5000, the dose was increased without further incident. A complaint of sore throat was made by 4 patients. This was not accompanied by any significant change in the white-cell count; and, as all cases occurred about the same time during treatment in hospital, it is reasonable to assume that they were due to intercurrent infections. Toxic dermatitis was noted in 2 patients during maintenance therapy with doses of 0·2 g. of methyl thiouracil. In both cases this happened twenty-one days after the start of treatment. The dose was reduced by half, and the patients made an uneventful recovery and continued maintenance therapy without further incident.

TABLE III—INCIDENCE OF TOXIC REACTIONS

Toxic reaction	40 patients treated with thiouracil	30 patients treated with methyl thiouracil
	Number of cases affected	
Thyroid hyperplasia ..	6	..
Granulopenia	2	..
Sore throat	2	2
Rash	..	2

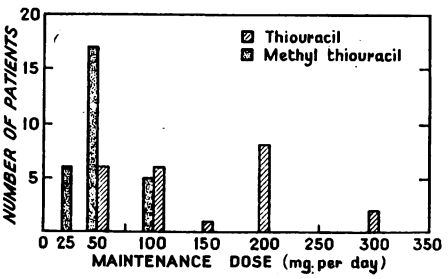

Fig. 2—Maintenance doses of thiouracil (23 cases) and of methyl thiouracil (28 cases).

Maintenance Therapy.—Of the 65 patients controlled with thiouracil or methyl thiouracil 56 have been satisfactorily maintained on small doses for 3–18 months. The daily maintenance doses of thiouracil varied from 0·3 to 0·05 g., and of methyl thiouracil from 0·1 to 0·025 g. (fig. 2). Apart from the smaller dose for methyl thiouracil there is little evidence that the one drug is more difficult to control than the other.

Effect of Withdrawing Therapy.—To determine whether it was necessary to continue thiouracil, treatment was stopped in 18 patients after they had been effectively controlled with the drug. In 12 patients the drug was withdrawn before, and in 6 patients after, a satisfactory maintenance dose had been fixed. The results are expressed in table IV. There is considerable variation in the period which elapsed between cessation of treatment and return of thyrotoxicosis. Only 3 patients have continued in satisfactory remission without further treatment to date. 2 patients were resistant to retreatment with thiouracil: after 70 days the treatment of case 12 was abandoned because of thyroid hyperplasia, which developed without remission of thyrotoxicosis; the other (case 5) required a high dosage for 84 days before there was any control of signs and symptoms. It is possible that some drug resistance had developed in these patients similar to that which develops in sulphonamide therapy. The evidence is strongly in favour of continuing administration of thiouracil in small maintenance doses without interruption. It is evident that, though thiouracil effectively controls the signs and symptoms, it does not eliminate the cause of thyrotoxicosis.

Thyroidectomy.—9 patients were referred for partial thyroidectomy: 4 because of thyroid hyperplasia produced by treatment with thiouracil, and 5 because of adenomata which before thiouracil therapy were producing slight tracheal compression. In all cases

TABLE IV—EFFECT OF WITHDRAWING TREATMENT WITH THIOURACIL IN 18 PATIENTS WITH THYROTOXICOSIS

Case	Daily dose before withdrawal (g.)	Period without treatment (days)	Daily dose for re-control (g.)	Daily dose for re-control (days)
1	1·2	104	0·2 0·1	113 At present
2	1·0	193	0·2 0·1	72 At present
3	1·0	160	0·4 0·2	21 At present
4	1·0	77	0·3 0·2	14 At present
5	1·0	104	0·8 0·6 0·4 0·3	63 21 28 At present
6	0·6	273	1·0 0·1 0·05	49 28 At present
7	0·6	210	0·2 0·1 0·05	21 112 At present
8	0·6	119	0·4 0·1	14 At present
9	0·6	415	..	No relapse
10	0·6	562	Nil	No relapse
11	0·4	245	0·1 0·15	46 At present
12	0·4	223	0·05 0·1 0·4 0·8	7 7 7 49
13	0·2	35	0·2 0·1	203 At present
14	0·2	276	..	No relapse
15	0·2	49	0·6 0·4 0·3	28 28 At present
16	0·2	42	0·2	At present
17	0·1	273	0·2 0·1 0·05	7 76 At present
18	0·1	122	0·1 0·05	21 At present

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thiouracil maintenance therapy was continued until the day of the operation. During the operation on the first 2 patients so treated there was extensive bleeding, and in the subsequent patients a preoperative course of iodine was given. This measure effectively diminished the bleeding and made the gland firmer and more easily defined. In all cases the thiouracil was stopped after operation and the iodine was continued for ten days. All the thyroidectomised patients have pursued a normal course without recurrence of thyrotoxicosis or development of myxœdema.

Anxiety Neurosis.—No patient in this group was affected by treatment with thiouracil or methyl thiouracil. There was little change in any of the signs or symptoms and no evidence of the resolution of the anxiety state. Undoubtedly the best treatment is by sedative drugs and suggestion therapy.

DISCUSSION

There is little doubt that thiouracil and methyl thiouracil are effective drugs in controlling thyrotoxicosis. Compared with thiouracil the response to treatment with methyl thiouracil is more rapid, and in the cases studied no thyroid hyperplasia was evident. The only toxic effects were in 2 patients who had skin rashes during maintenance treatment. The average maintenance dose of methyl thiouracil was smaller than was required with thiouracil. In the present study it has not been possible to compare the two drugs with regard to their effect on patients recently treated with iodine, though no theoretical reason is apparent why they should differ. Leys (1945) reported that in his series of patients treated with methyl thiouracil the time lag was protracted in one patient recently treated with iodine. It has not been possible to assess the value of methyl thiouracil in the treatment of auricular fibrillation associated with thyrotoxicosis; nor has there been any opportunity to observe the effects of thyroidectomy on patients treated with this drug.

The possible advantages of substituting some derivative of thiouracil for thiouracil itself in the treatment of thyrotoxicosis can be summarised as follows:

(1) A reduction in the lag period.
(2) A reduction in the chances of producing thyroid hyperplasia.
(3) A decreased liability to produce toxic effects.
(4) A smaller dose for maintenance.

In some respects methyl thiouracil fulfils these requirements, and it is easier to manufacture. It is suggested, therefore, that at the present time it should take the place of thiouracil.

SUMMARY

The results of treating 65 cases of thyrotoxicosis with thiouracil and methyl thiouracil have shown that the response to treatment is more rapid in patients treated with methyl thiouracil, and that the maintenance dose of methyl thiouracil is smaller than that of thiouracil.

Maintenance therapy with thiouracil has been withdrawn from 18 patients; only 2 patients have continued longer than a year without remission. There is evidence that withdrawal of treatment may be followed by resistance to re-treatment.

Of 6 patients treated with thiouracil who had auricular fibrillation, 5 have been restored to normal rhythm.

Recent treatment with iodine retards the response of patients to treatment with thiouracil. Preoperative iodine substantially reduces the bleeding during thyroidectomy of patients treated with thiouracil.

The incidence of toxic effects of the two drugs is discussed.

Of 5 patients with anxiety neurosis associated with the signs and symptoms of mild hyperthyroidism, none has responded to treatment with thiouracil.

It is suggested that methyl thiouracil should take the place of thiouracil in the treatment of thyrotoxicosis.

I wish to thank Prof. E. J. Wayne for the opportunities of studying the cases under his care; Prof. A. E. Barnes, Dr. A. G. Yates, and Dr. H. P. Brody for their coöperation; Mr. T. B. Mouat, who performed the thyroidectomies, for his valuable observations on these patients; and Messrs. Genatosan Ltd. for supplies of methyl thiouracil. Part of the expenses of this research were defrayed by a grant from the Medical Research Council.

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FOWLER'S POSITION

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"Fowler's position . . . marks the greatest advance in the practice of acute abdominal surgery since Lister's day."—Hamilton Bailey (1943).

"Frequent postoperative change of posture has superseded routine employment of Fowler's position."—Wangensteen (1942).

THE use of Fowler's position is based on the naïve assumption that fluids always run downhill. For half a century succeeding generations of medical students and nurses have been conditioned into such an unquestioning acceptance of its efficacy that it has now attained the status of a medical dogma, the denial of which is tantamount to the gravest charges of irresponsibility or even damnable heresy. Nevertheless there has been some recent criticism of the position, mostly of an indirect nature, and concerned with its harmful side-effects rather than with the central thesis of the prevention of subphrenic abscess.

We must first re-examine some aspects of the anatomy and physiology of the subphrenic spaces. Unfortunately many authorities include the right subhepatic (Rutherford Morison's) space with the suprahepatic spaces. It belongs anatomically and physiologically to the abdominal cavity proper, and its frequent involvement in suppuration is merely the result of its anatomical relationship to the gall-bladder, duodenum, and paracolic appendix. I am not concerned with the subphrenic extraperitoneal space, the importance of which has, I believe, been exaggerated by some authorities.

The suprahepatic subphrenic spaces differ from the main peritoneal cavity in respect of the special function of the diaphragmatic lymphatics in the absorption of particulate matter from the peritoneal cavity and in the pressure changes within the spaces during respiration.

Numerous investigators, notably MacCallum (1903) and Cunningham (1922 and 1926), have shown that the diaphragmatic peritoneum is the main route for the removal of particulate matter from the peritoneal cavity. There is normally a steady upward flow of intraperitoneal fluid towards and into the subphrenic spaces, where it is absorbed and passes into the diaphragmatic lymphatics. Cunningham states that carmine particles injected into the peritoneal cavity can be recovered from the mediastinal lymphatics within as short a time as three minutes.

This upward flow is determined by the differences of pressure between the general peritoneal cavity and the subphrenic spaces. Overholt's (1930) experiments show that the pressures in the subphrenic spaces vary with

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the intrapleural pressures and not with the intra-abdominal pressure. Since the intrapleural pressure is negative and the intra-abdominal pressure is rather above atmospheric, the intraperitoneal fluid is sucked into the subphrenic spaces and there absorbed by the diaphragmatic lymphatics. This is a vis-a-fronte mechanism applied to the thin film of fluid from its upper end, and the upward movement of such a film obeys the laws of capillary attraction rather than those of gravity. Large effusions will be influenced by gravity to a greater extent, but a proportion of their content is bound to enter the subphrenic spaces, whatever the position of the patient.

PNEUMOPERITONEUM

This upward flow of intraperitoneal fluid will be arrested if the continuity of the fluid film is interrupted. This takes place in pneumoperitoneum if the patient sits up and the air passes into the subphrenic spaces. Now, pneumoperitoneum is always present after laparotomy and in perforated ulcer, the two conditions which are responsible for the majority of subphrenic abscesses. Clearly another mechanism is involved here.

When a patient with a pneumoperitoneum sits up, the air collects in the subphrenic spaces under a pressure which is considerably less than the general intra-abdominal pressure and undergoes a respiratory fluctuation. If he has at the same time a collection of fluid in the subhepatic region, this will tend to be aspirated past the liver into the subphrenic spaces. It may be objected that if the patient is sitting up there will be no fluid in the subhepatic region, because it will drain into the pelvis. That this is not so can be demonstrated on most patients with perforated duodenal ulcer. On opening the abdomen in such a case the right subhepatic space is commonly found to be filled with fluid. If the operating-table is now tilted into the Fowler position, it will be found that there is little or no leakage of the fluid out of the space. In fact the right subhepatic space remains closed until the volume of the extravasated fluid exceeds its capacity, and only then does the excess fluid drain away along the paracolic gutter.

This upward movement of intraperitoneal fluid can be demonstrated radiologically in over a quarter of patients with perforated peptic ulcer, if they are radiographed standing up. Thaxter (1940) has shown that in 29·5% of such patients a fluid level is present at the bottom of the crescentic air space above the liver. His paper contains two excellent radiograms illustrating this.

The following case is a clinical illustration of the same mechanism.

A man, aged 47, was admitted to hospital for severe right hypochondriac and shoulder pain of 36 hours' duration. His general condition was excellent, and there was rigidity confined to the upper right quadrant of the abdomen. Radiography in the erect position showed a small collection of gas under the right cupola of the diaphragm.

I had previously treated 8 cases of subacute perforation of this type conservatively in the Fowler position, and he was treated in the same way. Next day his condition was satisfactory, but on the fourth day he had increased pain, his pulse-rate and temperature were rising, and examination of his chest elicited the classical physical signs of a gas-containing subphrenic abscess.

The abdomen was opened, and the subhepatic space was found filled with fluid; this was removed by aspiration, and a small perforation of a duodenal ulcer was sutured. A hand was passed round the posterior surface of the liver, and about a pint of fluid gushed out of the right posterior subphrenic space. A drainage tube was passed into the space and brought out through an independent stab wound in the loin. After all fluid had been aspirated from the upper abdomen, the lower parts of the cavity were examined and found to be free from fluid.

Unfortunately the drainage tube was removed prematurely, and he developed a typical right posterior subphrenic abscess, which was drained on the seventeenth day extrapleurally through the bed of the right twelfth rib. He made a complete recovery.

This case, besides showing the danger of the conservative management of minor perforations, illustrates very clearly the mechanism discussed above. A remarkable feature was the absence of soiling of the lower abdominal peritoneum with accumulation of all the extravasated gastric contents in the subhepatic and right subphrenic spaces. A similar sequence of events may well explain many cases of gas-containing subphrenic abscesses admitted to hospital within a week or so of the occurrence of a sharp attack of abdominal pain. In the case described above, the gas in the cavity could not have been produced by the activity of bacteria, because it was present from the time the patient was admitted to hospital.

Appendicitis.—Neglected appendicitis rarely causes subphrenic abscess. Out of 187 cases of late appendicitis with a mass, treated personally during the past eight years either by simple drainage of the abscess or non-interference, none progressed to subphrenic abscess, although 3 had right subhepatic abscesses. During the same period, out of 1163 appendicectomies for suppurative appendicitis I have had 4 cases of postoperative subphrenic abscess, not including another which resulted from the rupture of a pylephlebitic abscess of the liver. Oschner and Graves (1933), in their review of 3372 cases of subphrenic abscess, group appendicitis with gastric and duodenal leakage as the commonest cause of subphrenic abscess; but they also state that 70% of their cases were postoperative, and it is not possible to determine from their statistics what proportion of the non-operated cases had subhepatic rather than true subphrenic abscesses.

Cholecystitis.—The same experience is met with in suppurative cholecystitis. During the same period, 18 cases with subhepatic abscess were treated by drainage and cholecystostomy, and none of these developed a true subphrenic abscess, although pus was present immediately below the liver, and out of 73 cholecystectomies for non-suppurative conditions 1 patient developed a fatal subphrenic abscess, and 2 probable subphrenic inflammation which did not proceed to abscess formation.

Peptic Ulcers.—Excluding direct infection of the subphrenic spaces from abscesses of the liver or spleen or descending from the thorax (2·6% according to Oschner and Graves 1933), the great majority of subphrenic abscesses result from postoperative peritonitis or leaking peptic ulcers. The one factor common to these conditions is the presence of a pneumoperitoneum, and the practice of confining this to the subphrenic spaces by the adoption of Fowler's position facilitates the aspiration of infective fluid from the subhepatic region into the suprahepatic spaces. If the patient lies on his back, the air-bubble is situated anteriorly against the abdominal wall, and the liver falls back into its normal relationship to the diaphragm. Even if the bubble is sufficiently large for its upper part to lie anterior to the liver, the subphrenic pneumoperitoneum is now in continuity with the general abdominal pneumoperitoneum across the anterior surface of the liver, and pressure differences caused by the respiratory movements merely cause a shifting of the bubble and not of fluid exudates.

Why does subphrenic abscess not develop more frequently in the absence of pneumoperitoneum, since it is known that the peritoneal fluid enters the subphrenic spaces as a normal physiological event? One must assume that the normal mechanism has a definite protective value, and that the thin film of fluid enters the spaces at such a rate that the lymphatics are able to cope successfully with it. Moreover large infected particles, such as fæcoliths and lumps of infected lymph, are probably too large to be propelled upwards by the

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capillary force. On the other hand, the pressure differences occasioned by the pneumoperitoneum probably lead to the aspiration of fluid in bulk, with contained particles of macroscopic size, with the result that the local defences are overwhelmed.

VENOUS THROMBOSIS AND EMBOLISM

As a result of much recent work, notably by Homans (1934) and de Takats (1945) in America, and Rössle (1937) and Neumann (1939) in Germany, it is now established that postoperative thrombosis is much more common than was formerly believed, and that it usually starts in the deep veins of the calf or the sole of the foot and not in the iliac or femoral vessels as was previously taught. Most cases of femoral and iliac venous thrombosis are in fact secondary to upward spread from an initial quiet thrombosis in the calf veins. Dock (1944) gives some particularly alarming figures: 30% of all hospital cases have thrombi in the calf veins. In patients who have been confined to bed for over two weeks 60% show thromboses in the calf veins, and in nearly all of these there is some necrosis of the calf muscles also. It is to be noted that these are not all surgical cases, and that mere recumbency in the dorsal position with the calves resting on the bed is harmful in this respect. Fowler's position, maintained by a pillow behind the knees on which the calves rest, or by the soles of the feet pressing into the mattress, is particularly likely to induce thrombosis of the vessels in these areas. Even before the war surgeons, particularly gynæcologists, were beginning to realise the importance of active leg movements during the postoperative period but were often hampered in achieving this by the necessity of keeping their patients in Fowler's position. It is simply impossible to have frequent changes in position and active exercises and at the same time keep the patient in Fowler's position. Since no compromise is possible, either Fowler's position or the movements must be sacrificed.

POSTOPERATIVE CHEST COMPLICATIONS

The normal subject's respiratory mechanism is more efficient in the erect posture, because the liver and the upper abdominal viscera are firmly attached to the diaphragm by an intervening fluid film which transmits part of the weight of the upper abdominal viscera to the under-surface of the diaphragm. On standing, the diaphragm descends on an average 1½ in., and the vital capacity is increased by about a litre (Wilson 1927). After laparotomy the fluid film between the liver and the diaphragm is broken, because the pneumoperitoneum is confined to the subphrenic spaces by the adoption of Fowler's position. This has two harmful effects. First, the weight of the liver is now no longer evenly distributed on the under-surface of the diaphragm but falls on the suspensory ligaments of the liver. That this is a pain-producing event can be confirmed by observing any patient with a recently induced therapeutic pneumoperitoneum who is allowed to sit up, and it is possible that the abnormal stimulus induces a reflex inhibition of respiratory movements (particularly diaphragmatic) and diminution of the vital capacity. It is significant that Muller et al. (1929) found the postoperative diaphragmatic excursions slightly greater in recumbency than in the erect position. Secondly, the abdominal muscles are the normal antagonists of the diaphragm. During expiration their contraction raises the intra-abdominal pressure, and the liver and diaphragm are pushed, like a piston, into the lower chest. This mechanism is disturbed by the presence of an air-containing space between the diaphragm and the liver. From the purely mechanical point of view one would expect the postoperative abdominal patient to breathe less efficiently in Fowler's position than lying on his back. In the latter position the air-bubble passes anteriorly, and owing to the forward slope of the lumbar spine the liver falls back into its normal relationship to the diaphragm.

The familiar picture of posterior basal hypostatic pneumonia is likely to become less common if freer movements ensure that all parts of the lungs have their turn to lie uppermost.

King (1933) showed that 15% of abdominal and only 1% of non-abdominal cases develop chest complications. In males 47% of gastric operations and 36% of gall-bladder operations are so complicated. The suture of gastric and duodenal perforations carries the worst chest morbidity-rate—no less than 66%—whereas operations on the lower abdomen, such as intestinal suture (26%), appendicectomy (14%), and herniotomy (9%), which usually entail longer anæsthesia, have a lower postoperative chest morbidity. The two operations most likely to be followed by postoperative chest complications are for perforated ulcer and cholecystectomy. In cases of perforated ulcer a large pneumoperitoneum is usually established before the operation, and in cholecystectomy many surgeons adopt the evil practice of deliberately introducing air above the right lobe of the liver to enable them to rotate it more easily and so bring the gall-bladder to the surface.

SHOCK AND ANÆSTHESIA

The conflicting claims of recumbency and Fowler's position in shocked patients and in those recovering from anæsthesia sometimes leads to their being propped up while still in a semi-paralytic or shocked condition, and retained in position by the repeated efforts of the nursing staff and the judicious insertion of pillows at strategic points. This may prove calamitous to an overtaxed vasomotor system or may easily lead to fatal inhalation of secretions from the mouth or of vomit.

THE PATIENT'S COMFORT

No-one who has the most superficial acquaintance with nursing will dispute the difficulties entailed to the patient and nurse by the maintenance of Fowler's position, particularly if the patient is really ill. He must make a considerable muscular effort to maintain the position, and if this is not forthcoming he slips down and has to be replaced repeatedly. In either case rest and tranquillity of mind are lost.

CONCLUSION

There is ample evidence to justify the abandonment of Fowler's position. There is no doubt that the best position for a sick patient is the most comfortable one; and, since no position remains comfortable for long, he will be glad to move from side to side and on to his back if he is encouraged to do so. After a day or so the pneumoperitoneum is absorbed, and it is then safe for him to sit up if he wishes to.

It is a pleasure to thank Sir Heneage Ogilvie for his interest in the preparation of this paper. Many of the clinical observations which form its basis were made during the tenure of an E.M.S. appointment at the County Hospital, Farnborough, Kent, and I am glad to acknowledge my gratitude to Dr. A. Elliot, county M.O.H., Dr. H. F. Hackwood, medical superintendent, and their staff for extending unlimited clinical facilities to me.

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DENTAL CARIES

EFFECT OF CARBOHYDRATE SUPPLEMENTS ON SUSCEPTIBILITY OF INFANTS

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THE popularity of the theory that caries is due to disintegration of the inorganic constituents of dental enamel by the acid products of carbohydrate fermentation is such as to require little elaboration here. As is well known, the hypothesis is based mainly on the in-vitro experiments of Miller (1890); but, in the light of recent investigations, there is some reason to suspect that the initial lesion may be more closely related to destruction of the organic portion of the enamel surface (Pincus 1937, 1939). However, in view of the continued incrimination of carbohydrates by many authorities, despite the inconclusive findings of previous studies of their influence on human dental health (Bunting 1936, King and Croll 1939, Whyte 1943), an investigation was undertaken to test the effect on caries susceptibility of daily supplements of boiled sweets and chocolate-covered biscuits, food articles vociferously condemned by protagonists of the Miller theory. Owing to circumstances beyond my control, the scale of the study was eventually very much smaller than originally planned, and definite conclusions are still not possible. Nevertheless the consistency of the negative findings, especially those covering a two-year period, were considered to be of sufficient interest to warrant their publication. The children concerned were much younger than those in previous investigations of this kind and, the period of observation being one in which rapid growth obtained, it might reasonably have been expected to coincide with a relatively high degree of susceptibility to disease. In other words, the stage was set in such a way that, *if* the dietary supplements were dentally pathogenic, their influence might be more readily detected.

CLINICAL MATERIAL AND METHODS

Two nursery institutions were chosen for the investigation. Institution I was situated at Waddesdon, Bucks. The number of children studied was 22 (15 boys and 7 girls), and details of their ages are shown in table I. Institution II, at Orpington, Kent, originally included 46 infants (14 boys and 32 girls), these being separated into three groups; their average ages at the beginning and end of the test periods are given in table I. During the investigation several children were lost from each group, owing to moves or discharges. Average periods of residence at the institution were also calculated, the oldest group (A) having a slightly longer period of residence than the other two. Loss of children during the test did not affect the average time of residence of the remaining members of group A and lowered it only very slightly in groups B and C.

Immediately before the trials began the teeth of each child were examined with a probe and illuminated mouth mirror, and their condition was noted on special charts similar to those used by M. Mellanby (1934). Records were made of the number and state of eruption of the teeth and of both incidence and extent of caries, and the buccal tooth surfaces were graded for M-hypoplasia (Mellanby 1927, King 1938, 1940). As regards caries, diseased areas of the teeth were drawn on the charts, particular attention being paid to the extent of undermining decay, and notes were made of the physical texture of any carious dentine according to the criteria of Mellanby et al. (1924), which were summarised in the M.R.C. dental diseases committee report (1936). After this pre-test dental examination the teeth of each child were re-examined at six-monthly intervals, any alteration in caries incidence, extent, or texture being entered in a differently coloured pencil from that used initially.

The groups of children receiving the special supplements are indicated in table II. Children at Institution I received one boiled sweet daily for six months only, and no controls were here possible. At Institution II there were three groups: one control and two receiving supplements. The nature of the latter and the period over which they were given are also shown in table II. During the test period the children at each institution (including controls) were allowed their war-time sweet ration * (approximately 336 g. monthly) besides any supplied by me. In all cases the experimental supplements were given every evening after the last meal and after any cleansing of the teeth with toothbrushes or mouthwashes. It should also be pointed out that these supplements were given out by a responsible member of the institutional staff who took strict precautions to see that they were actually eaten at the stipulated time.

TABLE I—AVERAGE AGE AND DURATION OF INSTITUTIONAL RESIDENCE AT BEGINNING OF INVESTIGATION OF CHILDREN SEEN AT FIRST AND FINAL INSPECTIONS

Groups and supplements	No. of children	Av. age (months)	Av. duration of residence (months)
INSTITUTION I—Sweets group*	22	36·0 S.D. 11·49	21·1 S.D. 12·26
INSTITUTION II—			
Controls seen at beginning..	16	50·0 S.D. 8·60	20·8 S.D. 9·76
Ditto after 24 months ..	12	51·2 S.D. 9·43	20·9 S.D. 9·52
Sweets + chocolate-biscuits group seen at beginning	17	36·1 S.D. 6·70	13·1 S.D. 10·80
Ditto after 24 months ..	13	34·8 S.D. 6·44	10·2 S.D. 8·08
Chocolate-biscuits group seen at beginning	13	41·0 S.D. 6·77	13·0 S.D. 6·55
Ditto after 18 months ..	10	39·3 S.D. 6·18	11·7 S.D. 6·59

* In this group the same 22 children were seen at the beginning and at the end of the 6 months' observation period.
S.D. = Standard deviation.

The carbohydrate supplements were of two kinds, boiled sweets and chocolate-covered biscuits. The *sweets* were "fruit-drops," flavoured with lemon, orange, or raspberry essence, each weighing about 6·4 g. They were composed of sucrose 68%, glucose solids 28%, invert sugar 3%, water 1%. The "glucose solids" were the solids of glucose syrup, containing dextrose 20%, maltose 20%, dextrin 40%, water 20%. The *chocolate biscuits*, each weighing about 8·6 g., were described by the manufacturers as "Symbol Wheaten (half-coated) Chocolate Biscuits." The biscuit, which comprised two-thirds, was of the consistence of that commonly known as "digestive," the remaining one-third being chocolate. The approximate composition was as follows: *Biscuit*:—wheat flour 48·8%, total sugar 24% (reducing sugar 3·25%), fibre 7%, fat 17·2%, water 3%. *Chocolate*:—sucrose 43·5%, fat 32%, cocoa solids 24·5%. The "reducing sugar" consisted of glucose, lævulose, and maltose.

In addition to the main investigation, a dietary survey was undertaken in Institution II by Miss J. C. Chettle and Miss J. Griffiths, under the supervision of Miss M. W. Grant, B.SC., and Dr. M. M. Murray determined the fluorine content of the drinking-water at the same

* It was not possible to control the time of administration or the form of the war-time sweet rations, these being usually given during the afternoon and comprising various articles, including chocolate, toffee, and boiled sweets. It can be stated, however, that each child obtained the full ration allowed and, at Christmas and on other special occasions, even more than the ration.

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TABLE II—EFFECT OF DAILY (EVENING) SUPPLEMENTS OF BOILED SWEETS AND CHOCOLATE BISCUITS ON CARIES SUSCEPTIBILITY IN THE DECIDUOUS DENTITION OF INSTITUTIONAL INFANTS

Subject groups and dietary supplements	Total no. of children	No. of children with caries	No. of decid. teeth fully erupted†	No. of decid. teeth with caries
INSTITUTION I				
1st exam.*	22	1	400	2
2nd ,, after 1 sweet daily for 6 months	22	1	427	2
INSTITUTION II				
Controls				
1st exam.*	16	0	320	0
2nd ,, after 6 months ..	16	0	318	0
3rd ,, after 12 months ..	15	0	295	0
4th ,, after 18 months ..	14	1	272	1
5th ,, after 24 months ..	12	1	222	1
Sweets + chocolate biscuits				
1st exam.*	17	1	322	6‡
2nd ,, after 1 sweet daily for 6 months	17	1	338	7
3rd ,, ditto + 2 sweets daily for next 6 months..	16	1	320	7
4th ,, ditto + 1 choc. biscuit daily for next 6 months	14	1	279	7
5th ,, ditto + 1 choc. biscuit daily for last 6 months	13	1	259	7
Chocolate biscuits				
1st exam.*	13	0	260	0
2nd ,, after 1 choc. biscuit daily for 6 months..	13	0	260	0
3rd ,, after 1 choc. biscuit daily for 12 months	13	0	260	0
4th ,, after 1 choc. biscuit daily for 18 months	10	0	200	0

* Immediately before supplements given.

† The number of deciduous teeth present at each examination varied owing to eruption of new teeth in the younger children, later to shedding of deciduous incisor teeth, and in Institution II to reduction of total number of children owing to discharges from the institution.

‡ Two of the carious teeth were inadvertently filled by a visiting dental surgeon between the 1st and 2nd examinations; with this exception, no child received any dental treatment during the observation period.

institution. At Orpington, too, a brief dental survey was made of older children resident at the institution for various periods.

RESULTS

Dental Condition before Feeding Tests.—At the initial examination, immediately before the test periods, the incidence and extent of dental caries were extremely low in both institutions. No trace of caries or even of staining of the molar fissures could be found in any but 2 of the original 68 children; of the 1302 fully erupted deciduous teeth only 8 (0·61%) were affected by the disease. In every case the cavities were occlusal. At Institution I 1 child had two carious lower deciduous second molars, the cavity in each of these teeth involving less than a third of the anatomical crown. At Institution II 1 child had two lower second molars with cavities affecting more than two-thirds of the crown, and two upper second and two lower first molars with caries involving less than a third of the crown. In all of the eight cavities areas of both enamel and dentine were carious and the lesions of the dentine were soft in texture, indicating more or less active caries at the time of examination. It was clear, then, that the investigation proper was concerned mainly with the effect of sweets and chocolate biscuits on deciduous teeth previously unaffected by caries. At the same time, the eight originally carious teeth provided limited material for observing the action (if any) of these supplements on already diseased tissue.

Results of Feeding Tests.—The dental condition following administration of sweets and biscuits is summarised in table II, which shows that little or no increase in caries could be attributed to either of these delicacies over observation periods of six months to two years. To demonstrate these negative findings more clearly, however, some amplification of the table is necessary.

Institution I.—No new cavities formed in any of the 22 infants given one boiled sweet nightly for six months. In the 1 child having two carious teeth before the test the caries did not progress and at the final examination the texture of the affected dentine had changed from soft to extremely hard and polished ("arrested").

Institution II.—In the control group (A), one new cavity was found in a second lower molar at the fourth examination (after eighteen months); this cavity was small, but its floor was soft to the probe. Six months later, however, the affected dentine had become very hard and smooth to the probe; no increase in size of the cavity could be detected. As regards the chocolate-biscuits group (C) little comment is required. The children were caries-free at the beginning of the trial period and remained so throughout the eighteen months in which they received the biscuits. In the sweets + chocolate-biscuits group (B) one new cavity developed in the 1 child showing caries of other teeth before the test began. This cavity, involving an area on the occlusal surface of about 3 mm. × 2 mm., formed during the first six months. As the test period extended, however, its extent showed no appreciable change, while the affected dentine became progressively harder until, after a further eighteen months, no indentation of its surface could be made with a sharp probe. With regard to those teeth in this same child which were already decayed before the supplements were given, progressive "hardening" of diseased dentine was also observed. Except one upper second molar and one lower first molar inadvertently filled by a visiting dental surgeon during the first six months, at the final examination the remaining four teeth showed dentine of very hard consistence ("arrested").

It is clear, then, that the daily consumption of these particular sweets and biscuits by institutional infants did not increase the susceptibility of their deciduous teeth to decay during observation periods of up to twenty-four months, as judged by careful clinical examinations. The effect of the supplements on tissues already decayed is not so clear. Nevertheless it is apparent that caries did not progress, and the "hardening" of the affected dentine suggests that the caries was at least checked. In general, clinicians consider that any arrest of caries is accompanied, if not assisted, by breaking down of overhanging cavity walls, with the production of a relatively shallower cavity more capable of being cleansed by the mouth fluids, masticatory friction, or the toothbrush. It is of interest here that such a breaking down of undermined enamel and dentine was observed only in the two originally carious lower second molars (Institution II, group B) having cavities involving more than two-thirds of the crown. In the others, in which the previously diseased areas were much less extensive,

TABLE III—WEEKLY CONSUMPTION PER HEAD OF DIFFERENT FOODSTUFFS (MILK IN ML.; OTHER FOODSTUFFS IN G.) IN SAMPLES OF 8 CHILDREN FROM THE NURSERY AND 8 FROM THE MAIN BUILDING

(Average age of the samples was 3 3/12 and 4 3/12 years respectively.)

Foodstuff	Nursery	Main building	Foodstuff	Nursery	Main building
Milk ..	4975	7185	Bread ..	775	690
Cheese ..	15	—	Potatoes ..	720	995
Eggs (fresh)	110	45	Oatmeal ..	55	40
Eggs (dried)	—	12	Green veg.	25	10
Meat ..	50	150	Root veg.	65	65
Margarine*	143	157	Dried fruit	25	65
Sugar ..	80	88	Breakfast cereal ..	40	50
Jam ..	27	42			

* This represents all rationed fats.

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TABLE IV—AVERAGE DAILY NUTRIENTS PER CHILD*

Foodstuff	Nursery	Suggested requirements†	Main building	Suggested requirements
Calories ..	1313	1360	1610	1500
Total protein ..	43 g.	45 g.	57 g.	48 g.
Animal protein	28 g.	..	41 g.	..
Fat	61 g.	..	76 g.	..
Carbohydrate ..	150 g.	..	178 g.	..
Total calcium ..	937 mg.	1000 mg.	1315 mg.	1000 mg.
Non-cereal calcium ..	740 mg.	..	1283 mg.	..
Total phosphorus	1008 mg.	..	1355 mg.	..
Non-phytin phosphorus	921 mg.	..	1273 mg.	..
Total iron ..	5·6 mg.	7·4 mg.	6·7 mg.	7·7 mg.
Available iron‡	4·7 mg.	..	5·2 mg.	..
Vitamin A ..	7460 I.U.	2150 I.U.	7792 I.U.	2375 I.U.
Vitamin D ..	672 I.U.	..	685 I.U.	..
Vitamin B_1 (thiamin) ..	1·0 mg.	0·68 mg.	1·4 mg.	0·75 mg.
Vitamin C (ascorbic acid) ..	19 mg.	39 mg.	35 mg.	43 mg.

* Including cod-liver oil, orange-juice, and war-time sweet ration, but excluding special sweets supplements.

† Requirements recommended by the U.S.A. National Research Council's Committee on Foods and Nutrition (1941).

‡ Iron in national wheatmeal bread taken as 84% available.

no appreciable alteration in the shape of the cavities could be detected.

Incidence and Extent of M-Hypoplasia.—Dental defects of this type, which are often associated with increased susceptibility to caries, were in this study common throughout the groups of children at each institution. This was to be expected from the universally poor economic and nutritional status of their parents before the institutions took the children into their care. The relatively high incidence of such hypoplastic defects, combined with the surprisingly low incidence of caries, therefore indicates that whatever factor or factors prevented the development of caries and reduced the activity of previously established disease must have exerted their chief influence on deciduous teeth already matured.

Dietary Survey at Institution II.—It was considered that some idea of the general diet of the children might be of value. Accordingly, in January, 1943, nine months after the feeding tests began, a survey was made of the food intake of representative samples of the children in Institution II. It is here necessary to point out that in this institution the younger children live and feed in a special nursery block. When they reach the age of about four years they are moved to the main building. It was therefore desirable not only to have equal numbers of test and control children in the dietary study, but also to make two separate surveys, one of a group in the nursery, and another in the main building. The number of children studied totalled 16—8 from the nursery and 8 from the main building—and in each group 4 were from the control series and 4 were receiving two boiled sweets daily. Further precautions included equality in numbers of boys and girls, parallel age-distribution, and comparable time of residence at the institution in each survey group.

Two of the dietitians were in residence throughout the test week; and, with the enthusiastic coöperation of the institution staff, detailed records were compiled for each of the chosen children. At each meal, as the food was served, helpings were taken *at random* and weighed, each item separately. The plates were then marked with the children's names and given to the children, any waste on the plates being returned for reweighing. Both solid and liquid food was dealt with in this way. Orange-juice and cod-liver oil supplements (both given daily as a routine) were double-checked by weighing the stock bottles before and after distribution. All children received their normal sweet ration in full, but the experimental supplements were not included in the calculation.

The recipes used for puddings, cakes, stews, shepherd's pie, &c., varied too much from those given by McCance and Widdowson (1942) to warrant using their tables for the analytical value of the composite dishes. The dishes were therefore resolved into their ingredients for calculation purposes, adjustment being made for concentration due to water loss in cooking. The values for all foodstuffs were taken from the report of McCance and Widdowson (1942). Other values were obtained from the Rowett Research Institute tables (four items only). Vitamin values were assigned on the basis of those given by Fixsen and Roscoe (1939–40) and Olliver (1943), allowance being made for the time of the year and methods of preparation and cooking.

The results of the dietary survey are shown in tables III and IV. For purposes of comparison, in table IV are also given the requirements recommended by the United States National Research Council. Compared with these standards, the children's diets were deficient only in iron and vitamin C; in fact it is probable that the ascorbic acid intake was adequate. The daily intake of vitamins A and D was relatively high in both groups, a fact which would more than counteract the slight deficiency in calcium.

In the absence of any record of menus over a sufficiently long period, it is impossible to say whether or not the observed week is typical. From various inquiries, however, the dietitians were satisfied that at the time of the study (January, 1943) the food intake of the infants could be considered fairly characteristic of other times of the year, except the spring and summer months, when fresh fruits and green vegetables are more plentiful.

Fluorine Content of Drinking-water at Institution II.—The fluorine content of the water was 0·2 part per million.

Incidence of Caries in Children aged 10–14 Years at Institution II.—In the infant-feeding study (section 2) it was observed that each of the children showing caries at the first examination had lived at their respective institutions for no longer than a month. For this and other reasons, a random sample of 50 children, aged 10–14 years, resident at Institution II for various periods,

TABLE V—INCIDENCE OF CARIES IN OLDER CHILDREN AT INSTITUTION II AND AT NON-RESIDENTIAL SCHOOLS

District	No. of children	Age (yr.)	Permanent teeth: No. of teeth examined	Permanent teeth: Percentage of teeth carious
Lewis (rural) ..	228	11–13	4834	7·6 ±0·4
S.E. London ..	82	11–13	1881	19·2 ±0·9
Sheffield	48	11–13	1055	18·5 ±1·2
Lewis (rural) ..	185	13–15	4393	8·5 ±0·4
S.E. London ..	58	13–15	1257	27·0 ±1·3
Sheffield	60	13–15	1570	22·7 ±1·1
INSTITUTION II				
Resident for 3 years or more	33	10–14	731	4·5 ±0·8
Resident for less than 3 years	17	10–14	398	15·6 ±1·8

were next examined. The main findings may be summarised as follows:—

(1) 14 (28%) were free from decay of either deciduous or permanent teeth at the time of examination, and evidence from their dental cards indicated that these 14 children had not previously had caries.

(2) In the permanent dentition of the whole group the incidence of caries was 8·4% of the 1129 teeth examined.

Some association seemed to exist between the time of residence at the institution and the condition of the

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teeth; and, since all of the caries-free children had lived at the school for at least three years, the incidence of caries of the permanent dentition was determined for those who had lived there for (1) three or more years, and (2) less than three years, with the following findings:

(1) 33 children resident for three or more years: 33 out of 731 teeth (4·5%) were carious.

(2) 17 children resident for less than three years: 62 out of 398 teeth (15·6%) were carious.

Some idea of the dental condition of these children in relation to others in Britain of approximately similar age and judged by the same standards can be gained by a comparison with the findings of King (1940) among the children of the Isle of Lewis and elsewhere (table v). It can be seen that the dental health of the older children resident at Institution II for three or more years was even better than that of the country children of Lewis. The significance of this finding can be appreciated when it is realised that in 1937–38 the children living in rural parts of Lewis had much better teeth than those in other parts of Great Britain.

DISCUSSION

It has been shown that the deciduous teeth of institutional infants may be highly resistant to dental caries even if they are given *nightly* supplements of so-called "fermentable carbohydrates" immediately before going to bed and after any cleansing of the mouth or teeth. The quantity of sweets or chocolate biscuits taken varied from 6 to 13 g. daily. This was a small amount in comparison, for example, with the total food intake at Institution II of 286–357 g. daily (including the wartime sweet ration but excluding the experimental supplements). It should be noted, however, that in Institution II, on the basis of the dietary survey, about 50% of the total diet was carbohydrate (table IV) in one form or another (table III), and yet the amount and activity of caries observed over periods of from six months to two years were negligible. The relatively small scale of the investigation does not therefore seem to preclude the assumption that in these children good dental health was compatible with a high consumption of carbohydrate.

The association between defective tooth structure (M-hypoplasia) and caries susceptibility has been demonstrated on numerous occasions by M. Mellanby and others. In the present institutional investigation, however, though the incidence of such structural defects was relatively high, that of dental caries was remarkably low. The factors responsible for this resistance to decay must then have exerted their main effects *after* development and eruption of the deciduous teeth, and they also appear to have been operative in the permanent dentition of the older children (10–14 years) at Institution II. The possible beneficial influence of fluorine may perhaps be discounted in view of the comparatively low content of the drinking-water (0·2 part per million). It appears unlikely that the fluorine content of the food would bring the fluorine level up to the 1 p.p.m. mark, which has been suggested by some as the requirement of fluorine for caries-prevention. On the other hand, the dietary survey at Institution II revealed (in January, 1943) a high intake of vitamins A and D besides a fairly satisfactory level of calcium and phosphorus. This finding is of interest in relation to the various investigations of M. Mellanby and her colleagues concerning the value of vitamin D and mineral salts in the prophylaxis and treatment of caries. More than twenty years ago Mellanby et al. (1924) described the "arrest" of the carious process in children given diets rich in vitamin D, and she pointed out the manner in which the decreased caries activity could be followed clinically. The findings were illustrated by photomicrographs of deciduous teeth in which such changes had taken place.

The large majority of dental surgeons, however, refused to accept these observations, which were condemned on theoretical grounds of doubtful significance, although a practical test was carefully avoided. The findings of the present study support in no uncertain manner Mellanby's original description of arresting caries in which the dentine is involved. The "progressive" hardening of the previously diseased tissue can be detected clinically, until finally the dentine is burnished and impervious to the probe. Moreover, I noted that, in relatively small cavities involving areas of about 6 sq. mm. or less, the hardening of the formerly diseased dentine proceeded without detectable alteration in the inclination or height of the cavity walls—in other words, the cavity did not become "saucer-shaped" as described in the textbooks and can thus have been unrelated to attrition or the establishment of "self-cleansing" conditions.

It is tempting to speculate on the possibility that the relatively good calcifying properties of the diet consumed by the infants at Institution II may explain, in part at least, their high degree of resistance to dental caries. It is conceivable, too, that the consistently regular hours of meals, exercise, and rest of these institutional children, in contrast to the irregularities so often found in the private household, might have contributed to a better assimilation and utilisation of the dietary nutrients available.

SUMMARY

An investigation was made of the effects of daily supplements of boiled sweets and chocolate biscuits on the deciduous teeth of infants living at two institutions. The supplements were given at night, immediately before going to bed and after any cleansing of the mouth and teeth.

No increase in caries activity was found in the children over periods of from six months to two years. Indeed, at the end of the test previously active caries became "arrested."

A dietary survey at one of the institutions revealed a relatively high intake of vitamins A and D and a fairly satisfactory level of calcium and phosphorus. Carbohydrates formed a large proportion of the diet. The fluorine content of the drinking-water was only 0·2 p.p.m.

Examination of a group of older children (10–14 years) at Institution II also showed a strikingly low incidence of caries of the permanent dentition. This resistance to decay was more marked in those children with the greater period of residence at the institution.

My thanks are due to Sir Edward Mellanby, F.R.S., and Lady Mellanby, D.SC., for advice and criticism; to Dr. H. E. Magee, Ministry of Health, for introductions to the institutions; to Miss M. W. Grant, B.SC., Miss J. C. Chettle, and Miss J. Griffiths for undertaking the dietary survey; to Dr. E. B. Hughes (of J. Lyons and Co., Ltd.) and Mr. P. L. Bilham (of Bee Bee Biscuits Ltd.) for supplying and analysing the experimental supplements; to the authorities at the two institutions for the help and enthusiasm without which the investigation would have been impossible; to Miss I. Allen for assistance in compiling the tables; and to the Medical Research Council for financial support.

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HISTIOCYTIC MEDULLARY RETICULOSIS

A CASE WITHOUT LYMPHADENOPATHY

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UNDER the name of histiocytic medullary reticulosis a group of cases characterised by fever, wasting, generalised lymphadenopathy, and enlarged liver and spleen, and sometimes, in the final stages, by jaundice, purpura, anæmia, and leucopenia were collected by Scott and Robb-Smith.[1] The case reported here closely resembles them, except that there was no lymphadenopathy and the enlargement of the spleen was more rapid.

There was a superficial resemblance to some of the idiopathic hæmolytic anæmias, but against them were the normal fragility, the low reticulocyte-count, and the unraised van den Bergh. Correlation of the amounts transfused with changes in blood-count also revealed no abnormal blood destruction. Myelosclerosis was ruled out by the absence of radiographic bone changes and the absence of a leuco-erythroblastic blood-picture. The progress after splenectomy is another point against this diagnosis, for in myelosclerosis splenectomy is usually fatal. Chronic splenic neutropenia [2] bears some resemblance to this case but shows hyperplasia of the myeloid cells in the bone-marrow, blood reticulosis, and a raised serum-bilirubin level.[3] Moreover, sections of the spleen gave an entirely different picture.

CASE-RECORD

On Oct. 19, 1944, a shorthand-typist, aged 35, was admitted to the Central Middlesex County Hospital with three months' history of growing paler and getting short of breath. For three days she had felt weak and feverish and had an aching pain in the loins, with painful frequent micturition.

On examination she had a striking pallor, showing an earthy yellow tinge rather like that of leukæmia. The liver and spleen were enlarged (see fig. 1*a*). The enlargement was firm, smooth, and not painful on pressure. There was a soft lymph node the size of a cherry in the left anterior triangle of the neck, but no other nodes were felt. Nothing else abnormal was found on physical examination. There was no family history of blood disease and no history of contact with chemicals or medicines.

Her blood-count on admission showed a severe anæmia, Hb 49%, colour-index 0·87, red cells 2,870,000 per c.mm., with many macrocytes (average diameter 8μ), and a leucopenia of 2500 white cells per c.mm. with a relative lymphocytosis (86%). The platelet-count was normal (200,000 per c.mm.). Reticulocytes were 1%. Fragility of the red cells was normal. Sternal puncture revealed a highly cellular marrow, with a dearth of white cells at all their stages. There was no free hydrochloric acid in the alcohol histamine test-meal. The temperature was 103° F. A few colonies of *Bact. coli* were grown from a catheter specimen of urine; but five days later, and again on Nov. 11, 1944, no organisms were detected in catheter specimens and no growth developed on culture. For the next nine weeks she ran a high temperature, her white-cell count diminished steadily, and the spleen rapidly enlarged.

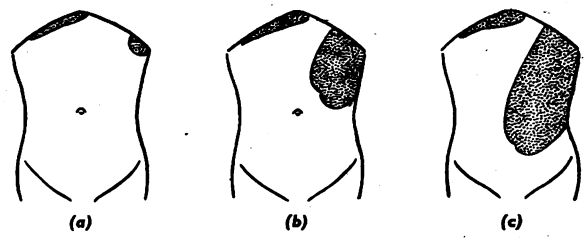

Fig. 1—Diagrams illustrating enlargement of spleen: *(a)* Oct. 20; *(b)* Nov. 20; *(c)* Dec. 20.

Medical Treatment.—No treatment, except blood-transfusions, had any effect. 'Fersolate' gr. 12 t.d.s. was given throughout her illness. Liver extract ('Anahæmin' 2 c.cm.) produced no reticulocyte response, nor did proteolysed liver ('Hepamino'). A course of 'Pentnucleotide' (260 c.cm. given intravenously and intramuscularly in fourteen days) provoked no increase in white cells. 'Sulphamezathine,' totalling 15 g., and later penicillin 435,000 units were given empirically to combat any vulnerable infection, but the fever did not abate, nor did the blood-picture change. The patient steadily deteriorated, the white-cell count fell rapidly to 200 per c.mm. on Dec. 13, 1944. The spleen enlarged so rapidly that the edge advanced more than ¼ in. in twenty-four

1. Scott, R. B., Robb-Smith, A. H. T. *Lancet*, 1939, ii, 194.
2. See *Ann. intern. Med.* 1945, **22**, 271.
3. Wiseman, B. K., Doan, C. A. *Ibid*, 1942, **16**, 1097.

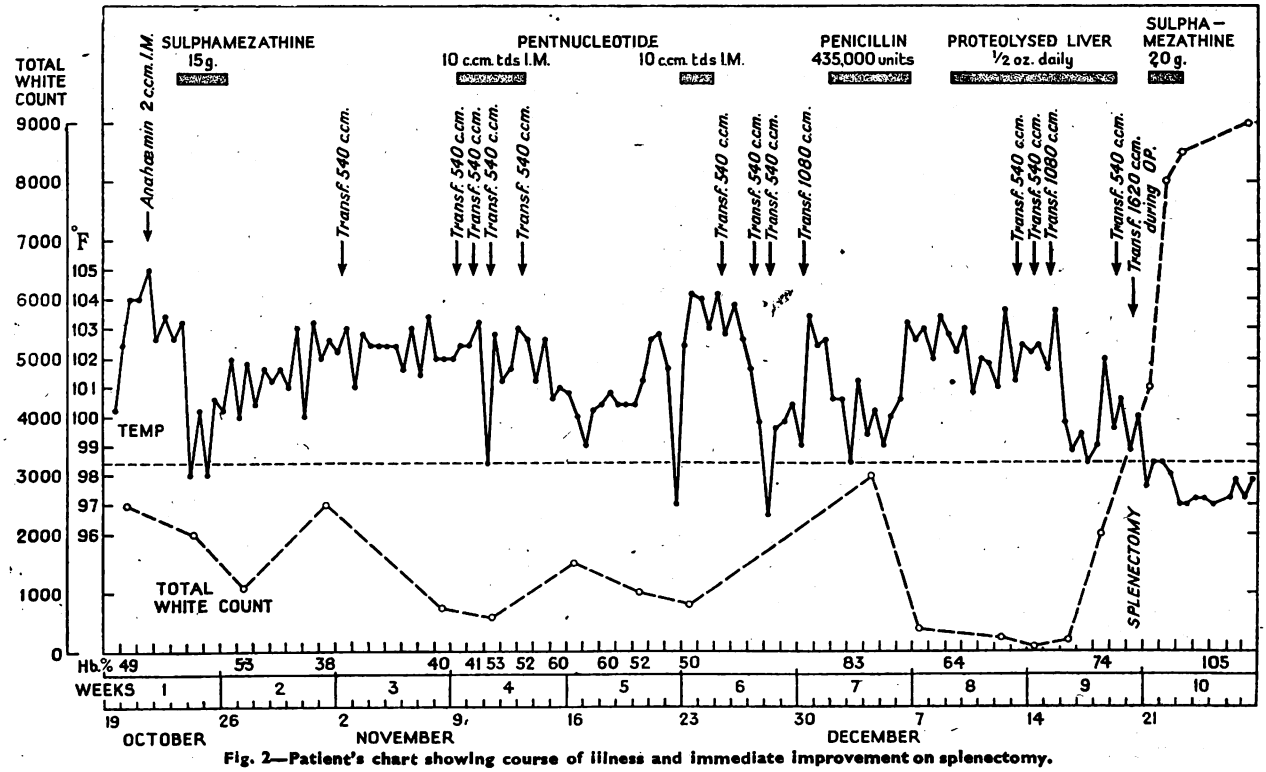
SULPHAMEZATHINE 15g.
PENTNUCLEOTIDE 10 c.cm. tds I.M.
10 c.cm. tds I.M.
PENICILLIN 435,000 units
PROTEOLYSED LIVER ½ oz. daily
SULPHA-MEZATHINE 20 g.
Anahæmin 2 c.cm. I.M.
Transf. 540 c.cm.
Transf. 1080 c.cm.
Transf. 1620 c.cm. during OP.
SPLENECTOMY
TOTAL WHITE COUNT
TEMP
°F
Hb% 49 53 38 40 41 53 52 60 60 52 50 83 64 74 105
WEEKS 1 2 3 4 5 6 7 8 9 10
19 26 2 9 16 23 30 7 14 21
OCTOBER NOVEMBER DECEMBER

Fig. 2—Patient's chart showing course of illness and immediate improvement on splenectomy.

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hours. It was carefully marked out on the skin, and drawings were made on several dates (fig. 1).

Splenectomy.—After nine weeks in hospital there was no doubt that without further interference the patient was going to die. She was becoming increasingly wasted and helpless, the response of the anæmia and leucopenia to blood-transfusions was only transient, and she was becoming exhausted by the protracted fever and increasing ponderous mass of the spleen. So splenectomy was considered justifiable, although the result was doubtful and the risk great.

A week before operation her white-cell count was only 200 per c.mm. and her Hb 50%, though she had already received ten transfusions of 540 c.cm. each. She was therefore given a further 2500 c.cm. of blood during the next week and went to the theatre with a count of red cells 5,000,000 per c.mm., Hb 74%, and white cells 2000 per c.mm. During the operation she was given another 1620 c.cm. of blood but received no more transfusions thereafter. Altogether in the course of her illness she was given thirteen transfusions totalling more than 9000 c.cm. of blood.

At the operation, performed by Mr. T. G. I. James on Dec. 20, 1944, the spleen was found to be bigger than the clinical examination indicated. The lower pole filled the left iliac fossa and extended well into that of the right side. The upper pole had elevated the left dome of the diaphragm considerably. The liver extended 9 cm. below the right costal margin. Its colour and texture were normal. The spleen after removal weighed 1180 g. and measured 30 × 15 × 11 c.cm.

Progress.—Her condition was fair at the end of this extensive operation, and she improved steadily from that day. Fig. 2 shows the sudden fall of temperature and proliferation of white cells, which were as dramatic as they were unexpected. Within twenty-four hours the temperature was normal and remained so, and the white-cell count was already doubled. These changes were accompanied by a corresponding improvement in general health and a rapid gain in weight. Eleven days after the operation she started getting up, and within a fortnight she was walking well. Her white-cell count rose to 16,500 per c.mm. and then settled at an average figure of 3000 per c.mm. She remained afebrile and was discharged from hospital on Jan. 15, 1945, three weeks after the operation.

Pathology.—Sections have been reported on by Dr. W. Pagel, of this hospital, and Dr. A. H. T. Robb-Smith, of Oxford. Both describe the same pathological changes: massive infarction of the whole organ, and between the infarcted areas an excess of cells, the cells being mostly erythrocytes, but among them (1) large phagocytic cells (histiocytes) containing engulfed red cells, and (2) large non-phagocytic cells (prohistiocytes) with single or multiple deeply basophil nuclei.

Progress after Discharge.—For four months after discharge she remained well with no symptoms. On May 7 she was readmitted with a recurrence of her old symptoms: pallor, breathlessness, and general weakness. The only abnormal physical signs were a soft enlarged liver reaching 7 cm. below the costal margin and a moderate amount of ascites. She was running a temperature of 101°–104° F. A blood-count showed Hb 50%, colour-index 1·1, white cells 1000 per c.mm. (44% neutrophils). Her condition was unchanged for a month, after which she improved spontaneously. The fever subsided, and the blood improved (Hb 90%, white cells 3000 per c.mm.). The liver became smaller, and the ascites disappeared. She was discharged on July 29.

Three months later she was admitted with Sonne dysentery. This cleared with 'Sulphasuxidine' but she continued to have fever and general weakness for the next two months. Her blood-counts remained relatively normal, showing a mild leucopenia (3000 per c.mm.) and a mild hyperchromic anæmia (Hb 75%). After two months the temperature subsided and the patient was allowed up. She was extremely weak in the legs and complained of numbness round the mouth and loss of taste and smell. Examination showed no objective changes in facial sensation, taste, or smell. She was allowed home at her own request on Nov. 17.

Dr. W. T. Hunt, her general practitioner, attended her from then till her death two months later. He has kindly given me details of her final illness. She remained afebrile and of good colour but became progressively weaker and emaciated. She developed increasing weakness of the face and jaw, with severe difficulty in speaking, eating, or swallowing. 'Prostigmin' had no effect on this weakness (the description slightly resembled that of myasthenia gravis). Three days before death she became jaundiced, had abdominal pain, and became comatose. She died on Jan. 18, 1946. Unfortunately a necropsy was not performed.

SUMMARY

A case of fever, wasting, enlarged liver and spleen, anæmia, and leucopenia, closely resembling histiocytic medullary reticulosis, except for the absence of lymphadenopathy, is described in a woman aged 35.

After splenectomy there was an immediate fall in temperature and a proliferation of leucocytes, accompanied by such an improvement in general health and weight that the patient was discharged from hospital three weeks after operation.

Four months after discharge from hospital she was readmitted with a recurrence of symptoms, but this improved spontaneously.

She died at home eight months later; death was preceded by jaundice, abdominal pain, and coma. No necropsy was performed.

I wish to acknowledge the help of Dr. A. H. T. Robb-Smith, Dr. Avery Jones, and Dr. W. Pagel, and to thank Mr. T. G. I. James for managing such a hazardous splenectomy. Sister Mileham is responsible for the chart.

PYLORIC OBSTRUCTION BY A MASS OF ASPHALT

E. R. DAVIES
F.R.C.S.
SURGEON, ANGLO-IRANIAN OIL CO. LTD., ABADAN

AN Iranian labourer, aged 21, had four days' intermittent upper abdominal pain and vomiting. There was no previous history of abdominal pain, nor did he admit that he had eaten anything abnormal. Vomiting was copious after a meal, but he did not vomit if he took only fluids.

On Examination.—A fit young man of no great intelligence, he was not dehydrated and had a normal temperature and pulse-rate. An oval tumour could be felt lying transversely in the right hypochondrium and sufficiently mobile to be pushed up into the epigastrium. A tentative diagnosis of a pedunculated gastric adenoma was made, the tumour being oval and too mobile for a subperitoneal hydatid cyst, and the blood-count was normal and Casoni test negative. Owing to a temporary breakdown it was impossible to give a barium meal.

Mass of asphalt which obstructed the pylorus (scale in inches).

Operation.—On laparotomy the tumour was found to be inside the stomach. Incision of the anterior wall revealed a hard black mass, which was delivered without difficulty. The gastric mucosa appeared normal, and the prepyloric portion was normal to palpation. Patient made a good recovery from the operation.

The specimen consisted of a mass of asphalt with some pomegranate seeds embedded in its surface. It weighed 30 g., and its size can be judged from the accompanying photograph. On section it was found to be almost homogeneous, and there were no food particles in the few holes in its substance.

Patient later said that he had worked in the asphalt plant about ten months earlier and had been in the habit of chewing small pieces, some of which he swallowed.

This habit of chewing asphalt is said to be even more common among workers in asphalt plants in England than it is here. Two more workmen with small abdominal masses have been found out of ten examined.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of psychiatry on April 9, with Dr. G. W. B. JAMES, the president, in the chair, a discussion on

Prefrontal Leucotomy

was opened by Prof. F. L. GOLLA, who described the operation's effect on the total personality from the point of view of descriptive psychology. Defective intelligence had, he said, been found after leucotomy, and ascribed by some psychologists to the operation; but this observation was probably due either to a defect consequent upon the mental disturbance or to an initial prepsychotic defect. In favourable cases the postoperative personalities were objective, with little interest in remoter possibilities, but no lack of prevision except in the assessment of subjective aspects of changes that were foreseen; and the emotional reactions were normal. Friends and relations reported almost no difference from the prepsychotic personality, except that the patient might be ruder, more downright, callous, self-indulgent, and lazy; but this was superficial. The distinguishing mark of the postoperative personality was a loss of the sense of responsibility; patients no longer felt responsible for their actions, and there was no self-questioning. The power of ethical valuation, the latest of the human faculties, which was compounded not only of reason but of emotion, had been lost. After operation, behaviour was objectively conditioned so that patients conducted themselves well; but the emotional element was lacking, and there was none of the anxiety caused by conscience. The conversion of an insane patient to a soulless robot would be an unfair way of describing the result of operation; physiological and clinical evidence demonstrated the lability of the central nervous system—even a simple reflex was teleologically determined. After operation there was a gradual reintegration of the ethical sense, which showed that there had been no irreparable mutilation. Leucotomy was simply a measure which allowed the patient to reintegrate his personality after being ridded of a hyperactive mechanism which had caused him anxiety. Psychotherapeutic attention must be continued for weeks or months after operation to restore the capacity for ethical valuation.

Prof. WALTER FREEMAN (Washington, D.C.) said that the support given to the operation by British psychiatrists had done much to overcome the reluctance of American doctors to recommend it. The improvement-span after operation was longer than had at first been believed; the recovery period might be placed at five years, but adaptation might be improved even beyond that; assessment was based on the pragmatic criterion of working capacity. The principle of leucotomy had now been extended to the relief of unbearable pain in non-psychotic patients. In psychotics it had been found that the operation was effective for this purpose, especially where pain was aggravated by anxiety, fear, or depression; the statement so often encountered, "this is worse than pain," was evidence of the superadded emotional toning. The focusing of attention on self and searching into the future were functions of the prefrontal area; the problem of pain was first intriguing, then obsessing, then menacing, and finally paralysing. Leucotomy had relieved the pain of phantom limb; it was certainly a formidable undertaking in the treatment of organic disease, but it had its place where other means had failed. Professor Freeman quoted examples of pain due to organic disease where the patient's distress had been relieved by leucotomy. One patient with carcinoma of the bowel and metastases to the sacral plexus, who was bedridden, paralysed, and incontinent, was given large doses of morphine every three hours; while receiving one injection, the patient pleaded for the next, thus evincing anticipation of further pain. After operation there was no interference with the appreciation of pain, but the patient no longer complained. A second patient with disabling tabetic crises induced by activity or domestic altercations was enabled by operation to lead a full life; he ceased to complain of pain, but spoke of twinges; it was the anticipation of pain which had crippled him. Similar results had been obtained in a woman of 45 with a thalamic syndrome following cerebral embolism, and a patient with vertebral arthritis, in both of whom an emotional element had contributed to the pain.

Dr. E. CUNNINGHAM DAX said that the operative approach to his last 130 cases had been through the temporal fossa, which gave a landmark for a constant plane of section; a Macgregor-Crombie leucotome was always used, with the intention of avoiding the signs of deterioration by severing only a small number of fibres. The approach was made from a point 3 cm. above the zygoma, so that the Sylvian vessels were always seen as a landmark. From this point bilateral incisions had been made in nine different positions, which had been worked out on fresh postmortem material by marking the brain through the drilled skull with dyes according to the points at which the leucotome should be directed, sectioning the removed brain through the dye marks, and making tracings against which the leucotome could be laid and the sections drawn. The incisions could be divided into four groups. In the first an upper incision was made 6 cm. above the zygoma, the planes of section being probably variable. The second was a middle incision; the leucotome was entered at a point 3 cm. above the zygoma and pointed at the junction of the middle and upper thirds of a line joining the zygoma to the vertex in the plane of the coronal suture on the opposite side of the skull. The third group included three different incisions: the first was a bilateral horizontal cut by pointing the leucotome from the temporal approach at a point 1 cm. above the supra-orbital notch of the opposite side; the second was also horizontal, but more posterior; the third combined the horizontal and middle vertical incisions. The two operations included in the fourth group were vertical incisions above the orbital cortex, one being 0·5 cm. deeper into the brain substance than the other; this vertical incision was the lowest that could be made without significant hæmorrhage if a leucotome was used. The two incisions not included in the series were a lower vertical and horizontal combined, and the other a cut parallel to the orbital cortex in a plane 15°–20° below the horizontal. Analysis showed that the symptoms of depression were best relieved by a lower incision, that the aggression of the catatonic might improve with a high incision, and that the paranoid schizophrenic might benefit most from the middle vertical combined with the horizontal incision. The tendency was towards lower incisions in better patients. There had been 5 deaths, 4 from hæmorrhage and 1 from pneumonia, all occurring in the first 83 patients. The conclusions were that very satisfactory results could be obtained by a minimal incision to avoid deterioration in chosen patients, even if they had not responded to other treatments, and that the effects of the lower incision were better than the remainder, particularly if there was a depressive element in the illness.

Dr. L. C. COOK said the risks of operation were such that it should never be regarded as a routine treatment; leucotomy was not a specific treatment for particular mental disorders, but it was of the greatest value in disrupting behaviour patterns from emotional disturbance. It was most beneficial in states of agitated depression, obsessive compulsion, florid schizophrenia, and long-standing behaviour disturbances as in aggressive psychopathy. Of 48 cases in his series, 24 had left hospital and 18 were working or looking after their houses; these results were better than some others, owing to careful selection. Patients who remained well for 18 months could regard themselves as permanently cured. Only 4 cases in the series had shown frontal-lobe disturbances after operation.

Dr. R. STRÖM-OLSEN said that the conditions most likely to be benefited by leucotomy were obsessional states, melancholia, and paraphrenia; but patients with other disorders became quieter and more manageable. Operation should be considered only when other treatments had failed, when the condition was of long standing, or where it was very severe. Of 116 cases in his series, the total mortality due to leucotomy was 5·2 %, and the onset of epileptic fits had been observed in 6·3 %. Of 31 cases discharged and followed up, nearly half showed an entirely satisfactory outcome; as the time which had elapsed since operation was reasonably long

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(2½ years on average), it was probable that these results would be permanent. But patients who seemed in hospital to be recovered or much improved might break down through interaction with the outside environment; and a careful follow-up, which included interviews with relatives, had proved the necessity of bearing in mind the risk that quite serious personality disorders might result from operation.

Dr. J. N. P. MOORE, commenting on a series of 150 cases, said that these were, by normal standards, prognostically hopeless. The average duration of symptoms was eight years, and the criterion of choice was emotional tension; the bulk of the material consisted of patients with schizophrenia. Of the 150 patients, 43 recovered and 32 were much improved; from these two groups 56 had returned home. A further 31 improved, 31 improved slightly, 9 were unchanged, and 4 died. Improvement might continue for five years; some might improve and then relapse, but no relapses had been observed in the recovered group. There had been no fatalities in the last 120 cases, and there was now tempered enthusiasm for the operation in selected cases; but operation should never be undertaken unless there were facilities for expert rehabilitation. Well-established periodicity in schizophrenia was a favourable prognostic sign, but the best results had been obtained in obsessional states, 6 out of 7 of these having recovered. The outstanding impressions of the operation were the excellent results in obsessional states, the encouraging results in melancholia, and the remarkable change of outlook in schizophrenia.

LIVERPOOL MEDICAL INSTITUTION

AT a meeting on April 11, with Dr. G. F. RAWDON SMITH, the president, in the chair, a paper on recent advances in the

Surgical Treatment of Deafness

was read by Mr. A. TUMARKIN. He divided surgical treatment of the symptom into that of otosclerosis and allied conditions, and that of suppuration. He considered that the modern fenestration operation as perfected by Lempert, although sometimes successful and a real advance on all previous techniques, had been much overrated by the popular press; he estimated the proportion of successful cases as about one in four, and urged caution in the presentation of results.

For the surgical treatment of chronic middle-ear suppuration radical mastoidectomy was to be condemned as a major and mutilating operation which commonly failed to cure the suppuration and more often than not increased deafness. The transmeatal atticotomy designed by him nine years ago was an operation of precision performed with minute gouges via an aural speculum; it utilised the external auditory canal as a natural shaft leading direct to the functioning structures of the middle ear. This operation was greatly superior to the radical mastoidectomy in many ways. It was a comparatively minor procedure which could be undertaken in adults under local anæsthesia; the resulting operation cavity was very small and healed rapidly and permanently; aftercare was reduced to a minimum; and, above all, hearing was improved in a large proportion of cases. Among 11 school-children with 2–12 years' otorrhœa who had recently undergone atticotomy, a dry cavity was obtained in 9 cases in 2–6 weeks; and in 5 cases the hearing improved. Since the ossicular chain was nearly always destroyed by prolonged suppuration, atticotomy should be performed as soon as it was clear that conservative measures could not succeed.

Mr. H. V. FORSTER said that he had seen some good results follow Mr. Tumarkin's transmeatal conservative operation for chronic middle-ear suppuration, though perhaps his comparison between this procedure and the radical mastoid operation by the postaural route had been a little severe. Though operating by the older approach behind the auricle, Mr. Forster preferred to be kind to the tympanic contents, especially in children. If necessary, one could work backwards from the attic instead of removing a wide area of the mastoid cortex. The war had revealed numerous cases of chronic middle-ear suppuration in recruits, some of whom heard remarkably well despite long-standing aural discharges.

HUNTERIAN SOCIETY OF LONDON

AT a meeting of this society in London on April 1, with Mr. A. E. MORTIMER WOOLF, the president, in the chair, an address on

The Second Biological Revolution

was given by Mr. JULIAN HUXLEY, D.SC., F.R.S. He recalled that the first biological revolution was due to Darwin, who enabled us to see life as a process instead of as a series of isolated events. The second revolution, which is the product of the last 2–3 generations, is the result of advances mainly in genetics and the study of evolution; we can now see life as a single biological process, in which the individual animal or plant body is a single unit in the whole.

The process depends on the following facts. First, living matter is capable of self-reproduction or, more accurately, self-copying. But, secondly, the process is not 100% accurate—hence mutation. Thirdly, the potentialities of mind are inherent in living matter.

The fact that there is always potentially more living matter than can survive accounts for the struggle for existence. Mutation produces variation; and mutation plus natural selection produces evolution. Natural selection is hastened by the biological invention of sex, which is primarily a device for allowing the recombination and redistribution of the potentialities of distinct strains. Natural selection merely implies differential reproduction by those with favourable variations. Mutation is a chance process due to single unpredictable events; it is usually unfavourable, but occasionally favourable. Geologists have shown that life on this planet is about 1000 million years old; on the basis of one generation a year and one hundred generations to spread a favourable mutation, no less than ten million favourable mutations could have been recombined in the latest types.

STEPS IN EVOLUTION

Some resist complete acceptance of the evolutionary theory on the grounds that a complex coadaptation (such as an eye) could not occur through chance events; but this possibility is realisable through natural selection, which is "a mechanism for generating a high degree of improbability." Evolution, in general, must always be considered in relation to the environment, which may itself change. In the process of biological change life can be observed as coming to exercise greater control over the environment and becoming ever more independent of its changes. Life has repeatedly radiated out into different lines to exploit the environment, and each radiation represents a process of closer adaptation to a particular mode of life. But another process also operates —that of life splitting into discontinuous groups: entomologists now recognise three-quarters of a million species of insects, and ten thousand more are being added each year; there are probably over a million species of animals and half a million species of plants.

Dr. Huxley traced the major steps in evolution. Life, he said, was at first ultramicroscopic, possibly consisting merely of naked genes; these became covered with cytoplasm, and took in more metallic elements; meanwhile the material which had nearly produced life was consumed by the living material. The cell was established relatively early; later, aggregations of cells formed multicellular bodies, paving the way for specialisation of parts. Colonisation of the land occurred long afterwards —about 300 million years ago, after three-quarters of the span of life on earth; next came full independence of the outer environment, notably in regard to constant temperature. Meanwhile, progress had been made in the nervous and psychical systems; the most notable step here was the development of conditioned reflexes, which led up to the ability to learn by experience and to insight. Man alone has a social life in which, by means of true language, he can transmit experience by tradition; this is an important subsidiary method of heredity, and natural selection is thus largely superseded in the human species by social selection.

NATURAL SELECTION

Natural selection operates in different ways, not all favourable; it may operate between one species and another, or intraspecifically (as with males competing

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with mates). The result in the latter case may be useless or even deleterious; for example, the wings of the argus pheasant and the train of the peacock are so specialised for display as to have become impediments in the ordinary business of life. On the other hand, the operation of selection in some insects with a caste system (i.e., including reproductive and neuter castes) is the only agency for the evolution of fully altruistic behaviour. Natural selection may also operate prenatally between members of a single mammalian litter, in which survival before birth is due to more rapid growth-rate. The human species, on the other hand, shows the culmination of an increasing slowness of development, which would have been impossible if several children were normally born at a time.

Evolutionary specialisation which involves improvement in one mode of life leads up a blind alley; thus there has been no major evolutionary change in ants for about 25 million years, in birds for about 15 million years, or in horses for about 10 million years. One-sided specialisation thus leads to a dead end, after which the type may either persist or become extinct. All-round improvement, on the other hand, can be truly called progressive, and does not come to a dead end.

Man, said Dr. Huxley, is unique in his variability, his subsidiary heredity derived from his social life, his persistent conflict (repression in early infancy leading to the development of conscience), and his sense of values. Man, alone among dominant evolutionary types, has not broken up into specialised lines, but has remained a single species. Here for the first time is the possibility of a single group, one unit for the whole world, the attainment of which will be the next major step in evolution. Meanwhile, we must attempt to establish a world ethic on a scientific basis.

No major evolution is going on except in the human species; in other types it has come to an end. "Man is the sole trustee of the evolutionary process; this is a terrifying thought, but a hopeful one."

SOCIETY OF MEDICAL OFFICERS OF HEALTH

AT a meeting of the fever hospital medical service group on March 29, with Dr. M. MITMAN, the president, in the chair, observations on

Chest Radiography in Pneumonia and Measles

were presented by Dr. THOMAS ANDERSON (Glasgow). He showed how in pneumococcal pneumonia the consolidation sometimes clears rapidly so that a normal radiogram is obtained in 2–3 weeks. In other cases the appearance of consolidation is still present after 5 or more weeks; in some of these elevation of the diaphragm and other signs suggest the possibility of collapse, but in the majority no such signs can be found. The radiographic picture of delayed resolution is usually that of a feathery opacity with linear and circular markings; and as a rule the periphery clears most slowly. The earlier figures of incidence which he had recorded were supported by more recent statistics, which showed that the complication may occur in 35–40 % of patients with pneumococcal pneumonia who are over 35 years of age. Eventually—sometimes after 2–3 months—the radiographic appearance returns to normal, which suggests that the condition is not fibrotic. It should be remembered that until then many patients remain considerably incapacitated. It has been established that delay in resolution is most likely in patients who show the densest initial opacity.

Of the radiographic appearances in measles, Dr. Anderson said that in some patients the diagnosis of bronchopneumonia is not in doubt. In others there are markings, particularly at the right inner base, which are in keeping with a diagnosis of partial collapse; although some of these are perhaps doubtful, others are quite typical of collapse. The importance of recognising this state was underlined by a demonstration of radiograms from patients who had been admitted with the diagnosis of pneumonia but who were found to have collapse of the lung with bronchiectasis. In each case the starting-point in the history was an attack of measles complicated by "pneumonia," after which the patient had several pneumonic episodes. Dr. Anderson suggested that doubtful cases should be carefully followed-up.

Reviews of Books

Active Psychotherapy

ALEXANDER HERZBERG, M.D., PH.D. London: Research Books (distributed by Heinemann). Pp. 152. 12*s.* 6*d.*

IN the preface Dr. Herzberg says he has no illusions about the unfavourable reception his book will receive among psychotherapists, because he does not belong to the Freudian, Jungian, or Adlerian schools and attributes importance to inborn disposition. He is unduly pessimistic, since doctrinaire attitudes on this matter are less common than they were before the war: everyone recognises that orthodox psycho-analysis is a costly treatment, beyond the reach of all but a tiny fraction of the people who need psychiatric help; consequently his methods, which he claims are short and fairly successful, will receive a welcome proportioned to the evidence that supports these claims. Dr. Herzberg combines psycho-analysis, persuasion, alteration of the personal environment, and what he calls tasks. These tasks are the central feature of his active treatment, and force the patient, on the doctor's suggestion, to discipline himself in necessary ways. Although, probably for the sake of clarity of statement, some obvious problems of technique and psychopathology are left untouched, the book gives on the whole a clear account of the author's procedure, especially in the handling of sexual perversions.

Textbook of Bacteriology

(14th ed.) EDWIN O. JORDAN, PH.D., late professor of bacteriology, University of Chicago; WILLIAM BURROWS, PH.D., associate professor of bacteriology in the university. London: Saunders. Pp. 909. 35*s.*

WITH many of the chapters rewritten, more than 200 fresh illustrations, and new sections on respiratory enzymes, oxidation-reduction potentials, and the antibiotic substances, this standard American work is now well in line with modern thought. Chapter headings, such as bacterial physiology, the relation of bacteria to disease, and the transmission of infection, indicate a welcome tendency to teach the student fewer purely descriptive facts and more of the reasons why bacteria behave as they do: he is made aware of the complex lives led by bacteria, and of the part played by the biochemist and physicist in disentangling their story. The good summaries on epidemiology will be far more useful to the student and practising doctor than the details of staining or cultural reactions. In a book covering not only bacteriology but medical mycology, parasitology, and virus diseases it would be unusual not to find questionable statements. It is debatable, for example, whether the efficacy of T.A.B. vaccine has been conclusively proved, and whether salmonella food-poisoning is a rare disease even in America. This book, however, provides for student and specialist a balanced and accurate account of modern knowledge about infective agents.

Science in Progress

Fourth Series. Editor: GEORGE A. BAITSELL. New Haven: Yale University Press. London: Oxford University Press. Pp. 331. 20*s.*

THE lectures here collected are hard reading, not because the authors lack skill in verbal exposition, but because each of the lectures is intended for educated people whose scientific knowledge lies in another field than that of the expositor; consequently there is neither condescension nor spurious simplification. Medical readers will be chiefly interested by W. R. Miles on the psychological aspects of military aviation; D. W. Bronk on the physical structure and biological action of nerve-cells; Selig Hecht on energy and vision; Otto Loewi on the chemical transmission of nerve impulses; C. A. Elvehjem on the vitamin-B complex; and Edwin Cohn on blood and blood derivatives. The five lectures, all authoritative, deal with such other things as the mathematical nature of physical theories, the magnetic approach to the absolute zero of temperature, vacuum chemistry, and atomic theory; it is a measure of the interdependence of scientific knowledge that much in them has a bearing on recent developments in medical research.

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THE LANCET

LONDON: SATURDAY, MAY 4, 1946

Charter for Health

THE present battle over the Health Bill is like a family quarrel: it will come to an end because all the members of the family are prepared to set about composing differences which might thwart the common aim. The Battle for Health (to borrow an imaginative designation) is more enduring but less audible. Since those who are aware of it are all on the same side, it does not lend itself to polemics; and many whom we may hope to call allies have not yet realised that the battle is on.

Until recent years it could fairly be said that the family doctor was engaged in a series of independent guerilla engagements with individual cases of sickness. Like the good guerilla fighter, he was often a bigoted individualist, viewing with suspicion those pioneers who urged an integrated social attack based on a study of the enemy's dispositions. But most of the medical men whose premature devotion to such causes as drains or diet or sunshine earned them the epithet of crank from their bedside-minded colleagues have now reached posthumous respectability; and their successors in the fields, for instance, of social psychiatry and occupational medicine have had a gentler reception—perhaps because most medical practitioners now glimpse, and some see very clearly, the general character of the struggle in which they are taking part. One result of this new vision has been the realisation, to quote the British Medical Association's *Charter for Health*,[1] that "good health is not entirely, or even mainly, a question of medical services. It does not depend so much upon hospitals or doctors or bottles of medicine or organisations as upon a suitable environment and a proper attitude toward health." The layman understands less easily that a comprehensive medical service, however excellent, cannot be a comprehensive health service: nothing less than the whole of social legislation could merit such a title. It is for this reason that the recommendations of the B.M.A.'s book cover the whole environment in both its physical and psychological aspects in relation to health.

One theme that forces itself to the front throughout is that preventable diseases can be, and to some extent are being, prevented. But how unevenly this preventive knowledge is being applied. Infant mortality is more than twice as high among the children of labourers and semi-skilled workers as among the children of professional men; the mortality from measles is nearer ten times as high. In almost every form of ill health the same pattern recurs; and though infant mortality in all classes has progressively fallen, the time-lag always remains between the higher and lower socio-economic groups: "the labourer's baby in 1931 had as good a chance of survival as the professional man's baby in 1911"; or should one say, "no better chance"? The *Charter for Health* aims at removing these differences of morbidity and mortality between social classes, and it includes a timely reminder that we must also obliterate differences in health, at least as great, between national groups. "Basic health," it says, "is the same for men the whole world over, whatever their race or colour. It is well known that the condition of the majority of peoples is far below the minimum requirements." Sir JOHN ORR, F.R.S., under whose chairmanship this charter was drafted, has since undertaken the exacting task of carrying its principles into international practice in the sphere of nutrition.

The publication of this charter underlines the common purpose which not only the National Health Service Bill but all social legislation must serve. With admirable clarity it gives, as it sets out to do, a simple exposition of "the basic principles of health." In it the British Medical Association speaks with a true sense of proportion and a sound appreciation of its social responsibilities.

1. Charter for Health. London: Allen & Unwin. Pp. 90. 6s.

Penicillin in Dermatology

IN March, 1943, the FLOREYS [1] reported success with the local application of penicillin ointments or solutions in 37 cases of blepharitis. In November of the same year CHRISTIE,[2] speaking on behalf of his colleagues at Hill End Hospital, recorded that some cases of sycosis barbæ and impetigo had responded satisfactorily to such applications. Five months later the ROXBURGHS and CHRISTIE [3] added furunculosis, otitis externa, and secondarily infected eczema to the list of conditions which sometimes respond. The care with which this early work was performed can be gauged by the fact that few additional skin diseases have since been drawn within the scope of penicillin therapy. From an elementary but practical standpoint the question that the doctor prescribing penicillin for a skin ailment has to decide is whether the eruption is largely due to staphylococci or streptococci; if so, provided the organisms are penicillin-sensitive, improvement and cure may reasonably be expected from the drug. If the infection is superficial, good results may usually be anticipated from local therapy; if it is relatively deep-seated, as in boils and carbuncles, penicillin is best given parenterally. An expert may reasonably protest against this simplification, but if the tyro will remember it much waste of penicillin will be avoided.

How should penicillin be applied to the skin? Applications in powder form have not been widely used. An aqueous solution containing 200–1000 units per c.cm., applied as a spray, seems to be the best method, for the affected areas may be left uncovered, and there is no risk of trauma from the careless removal of dressings. The atomiser used should ideally be of glass, or should have a glass reservoir with tube and nozzle made of some metal such as stainless steel which does not cause deterioration of penicillin; but an ordinary throat spray has often been successfully employed. The reservoir should be emptied frequently and sterilised at least once every five days, to prevent contamination of the solution. The spray is applied from three to six times every 24 hours, and the affected areas thoroughly but not wastefully wetted with solution.

1. Florey, M. E., Florey, H. W. *Lancet*, 1943, i, 387.
2. Christie, R. V. *Proc. R. Soc. Med.* 1944, 37, 110.
3. Roxburgh, I. A., Christie, R. V., Roxburgh, A. C. *Brit. med. J.* 1944, i, 524.

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For outpatients, and in conditions in which the patient has to be responsible for his own therapy, an emulsion—the so-called penicillin cream or ointment—will be preferred. Usually this preparation contains about 500 units of penicillin in each gramme, and as a rule the supply should be renewed every 10–14 days, for the potency slowly deteriorates, some 30% being lost in a fortnight under the normal conditions of north-west Europe.[4] By arrangement with the Ministry of Supply drug manufacturers now issue a suitable sterile base to which the required amount of penicillin salt dissolved in sterile water can be added to produce an active preparation; this base is a semi-solid oil-in-water emulsion made by the incorporation of water into 'Lanette wax SX.' Some prefer a water-in-oil emulsive base, like the proprietary 'Eucerin L.M.' recommended by GROSSMARK and PLEWES [5] for paronychia and other surgical cases. CHAMINGS [6] favours an oil-in-water emulsive base for most types of skin, but prefers an oil base if the skin is moist and the sweat glands unduly active. Some will choose a base which consists of 0·5% agar in distilled water,[7] or tragacanth jelly,[8] both of which are non-greasy and clean in use. A paste in which penicillin would be combined with medicaments which control eczematous reactions would be ideal for the treatment of varicose eczema and similar dermatoses, but its formulation presents many difficulties, because zinc, kaolin, and many other familiar constituents of pastes destroy penicillin.

Of the errors to be avoided in treating skin diseases with penicillin one is over-reliance on the drug. The introduction of penicillin has not rendered obsolete those minor measures of nursing and surgical care whose worth has been proved for many years. For example, in the treatment of impetigo it is still wise to clean off crusts and cut short the hair on affected areas of the scalp before commencing treatment. Similarly, penicillin does not remove the need for evacuating pus from blebs and more deeply seated lesions. It is a mistake, too, to imagine that accurate diagnosis will be less essential when we have a potent specific remedy to hand. Thus TWISTON DAVIES and colleagues,[9] in a trial of penicillin in soldiers with common skin eruptions, found that seborrhœic dermatitis, especially on the face, may closely simulate impetigo but responds only partially to penicillin therapy. When penicillin is freely obtainable for civilians, therefore, we must expect to see many cases of "impetigo" which are impervious to the drug. Another cardinal error which will become common when the antibiotic is more generally available is to continue penicillin applications too long. As VICKERS [10] emphasises, if there is not an early response to treatment the application should be discontinued. It would be well if every pot of ointment bore HELLIER'S [11] dictum: "If the lesion has not responded in a week it will never respond to penicillin, and some other treatment should be used." When a short course has failed, radical cure is unlikely to be achieved by protracted treatment, either because the causal organisms were penicillin-resistant to begin with or have become resistant; they may pass into a quiescent stage in which, because reproduction is sluggish, their vulnerability is reduced so that although the eruption becomes less acute it flares into activity soon after penicillin therapy ceases. The persistent use of an oil-in-water emulsion may lead to maceration of the skin, particularly if the area is kept bandaged. Moreover, there is a risk that long-continued application will sensitise the patient's skin to penicillin,[12] though in HELLIER'S large experience [11] this risk is slight compared with that of sulphonamide sensitisation. The figures published by HELLIER and HODGSON [13] are valuable in determining the optimum period of treatment. With a penicillin spray, impetigo was cleared in an average of 8·6 days. In ecthyma the penicillin spray was used for about 6 days, and the cure completed in an average of 12·3 days with applications of 2% ammoniated mercury in Lassar's paste or cod-liver oil ointment. In treating sycosis barbæ they used the antibiotic only for 7–10 days and then changed to 'Quinolor' compound ointment. These are examples of the wise restraint which all must practise if they are to get the best out of penicillin therapy.

4. Taylor, P. H., Hughes, K. E. A., quoted by Hellier, F. F., Hodgson, G. A. *Lancet*, 1945, ii, 462.
5. Grossmark, G. J., Plewes, L. W. *Brit. med. J.* 1945, i, 906.
6. Chamings, A. R. G. *Brit. J. Derm. Syph.* 1946, **58**, 1.
7. Coles, R. B., Barker, A. N., Robertson, E. A., Cowan, S. T. *Lancet*, 1945, i, 720. Roberts, D. *Ibid*, 1945, ii, 383.
8. Spencer, J., Bishop, E. J., Ricks, A. *Ibid*, Jan. 26, p. 127.
9. Twiston Davies, J. H., Dixon, K., Stuart-Harris, C. H. *Quart. J. Med.* 1945, **14**, 183.
10. Vickers, H. R. *Lancet*, March 2, p. 307.
11. Hellier, F. F. *Ibid*, March 16, p. 400.
12. Annotation, *Ibid*, March 2, p. 316.
13. Hellier, F. F., Hodgson, G. A. *Ibid*, 1945, ii, 462.

Remuneration

WHENEVER doctors are gathered together to discuss the National Health Service, someone is bound to ask "How can we judge the scheme without knowing how and what the general practitioner is to be paid?" And it is true that the Bill and its accompanying white-paper provide little basis for an answer to this plaint.

Uncertainty about the amount practitioners are to be offered must doubtless continue until after the consultations between the Government and the profession which are to follow the publication of the Spens Committee's report. (This committee, which is considering the range of remuneration appropriate for doctors taking part in a publicly organised medical service, has long since completed hearing all pertinent evidence, and its report will probably appear next week.) Meanwhile uncertainty about the amount of remuneraton should not prevent full discussion of the methods by which it is to be paid; and for this the chief official text has been paragraph 46 of the white-paper:

> "The Bill itself does not determine the detailed terms and conditions for doctors joining in the service or the doctors' remuneration. These are left to be settled by regulations, and the necessary regulations will be made in consultation with the doctors' professional representatives. It is, however, the intention that remuneration should take the form of a combination of fixed part-salary and of capitation fees, the latter varying with the number of persons whose care is undertaken by each doctor and being so graduated as to diminish in scale as the total number of patients rises. Variation of the fixed part-salary will be possible so as to take account of different circumstances and experience and the differing conditions of practice in particular areas."

The first point arising from this statement is the wisdom of having all these matters left to regulations. Many doctors feel strongly about the varying effect

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which different methods of payment might have on their professional lives. For two main reasons they had hoped to find the Government's intentions clearly stated in the Bill. First, they felt that any unwelcome proposal would then not only be more directly obvious but also be more amenable to amendment during legislation than if it were left to be promulgated later among a host of kindred regulations. Secondly, they took the view that, once a satisfactory method was agreed, it should be given the comparative immutability of a clause in the Act, rather than the inconstancy of a regulation changeable at the fiat of any future Minister. This is considered particularly important if payment is to contain a salary component; for once the principle of part-payment by fixed salary was accepted or imposed by regulation, a Minister could so easily change the proportion which the salary component bears to the total remuneration that it would be possible for him virtually to convert the service overnight into one wholly paid by fixed salary—the very position the medical profession has been seeking to avoid.

The aim of the MINISTER OF HEALTH, it would seem, has been to frame a scheme that will ensure sufficient remuneration for the young doctor on entry to practice, and also increasing rewards later; and at the same time he has tried to provide for attracting more doctors to areas at present unpopular or difficult to work. To attain these objects he suggests that practitioners should receive part of their remuneration in the form of a fixed salary—which can be varied to allow for differences in experience and for differing conditions of practice—and part of it in the form of capitation fees so that their earnings will vary with the number of patients they attract. But lest any doctor, wishing to augment his income, should be tempted to undertake the care of too many patients, the MINISTER introduces the idea of a graduated capitation fee which is to "diminish in scale as the total number of patients rises"; and here he appears to have gone beyond what is necessary or desirable. In theory it is not difficult to state a case for a diminishing scale: beyond a certain saturation-point, the more patients a practitioner has, the less time and care he can give them, and the less he deserves in return. But in practice the MINISTER'S plan would not work out this way: saturation-point would vary vastly with doctors of different personalities and capabilities, and it does not follow that the man who had most time to spare would give the best service. Moreover clause 33 (2b) of the Bill suggests that, as under National Health Insurance, there will be a limit to the number of patients the doctor may put on his list; and presumably the maximum chosen will not be so high as to preclude conscientious and efficient care. If it is fixed at such a level, nothing can be said for any further measure that will discourage the efficient and popular doctor from taking as many patients as he is allowed. The factor of diminishing returns is already introduced by income-tax payments and will be reinforced by any system which provides for part-payment by fixed salary; for obviously if a doctor is paid by an unvarying salary plus a capitation fee for each patient the average return per patient will fall as the number on the list rises. To add a sliding scale of capitation not only is unnecessary but might lead practitioners to discourage free choice of doctor by patients. If three or four doctors are working in partnership it would be to their advantage to divide their patients as evenly as possible rather than allow a popular partner to accept a large proportion at reduced rates. Used as a substitute for the basic part-salary and the limitation of lists, the diminishing capitation fee might have something to recommend it. But used as an additional brake, when the two other methods are also to be employed, it has no apparent merits.

Altogether, it seems that this is a subject requiring much thought, and one which could well be referred for early discussion between the MINISTER and representatives of the profession. Such discussion would not be likely to reveal any new methods of payment; for, except the now-discredited method of payment by item-of-service, elements of all methods find a place in the white-paper—salary, capitation fee, bonus for difficult areas, limitation of lists, and finally the diminishing fee for the over-popular doctor. By including something of almost everything the MINISTER incurs the danger of accumulating the disadvantages of each, without finding in the composite scheme any commensurate advantage. We hope that this is a matter on which he will be willing to think again. He would improve the Bill—and certainly would make it more intelligible to doctors—if he could include an agreed method of payment. We can hardly suppose that the objections to "negotiation" with the medical profession, which he expressed in Tuesday's debate, will extend to discussion of technical problems.

Health in the Sudan

IT is a far cry from the days of Gordon, when Khartoum was a hotbed of disease and the whole of the Sudan was ravaged by epidemics of malaria, dysentery, dengue fever, smallpox, and cerebrospinal meningitis, to the state of affairs described in the report of the Sudan Medical Service for 1944, now published. With the formation of the condominium government at the beginning of 1899 the control of endemic disease was taken in hand, and Khartoum rapidly became famous for its efficient antimalarial organisation. Endemic disease has since been brought under control in most areas of the northern Sudan, and epidemic disease is now effectively dealt with as it arises. Malaria is comparatively rare in the north, which used to be swept by epidemics with an appalling mortality; endemic malaria persists, but the mortality is relatively low. Cerebrospinal meningitis now occurs only sporadically in the north, though extensive epidemics still arise in the southern and central Sudan. Smallpox, once a terrible scourge, is now almost unknown, despite its prevalence in neighbouring countries. The incidence of sleeping sickness, which threatened a large part of the southern Sudan before and during the war of 1914–18, has been reduced to less than 100 cases a year.

The Sudanese are now a comparatively healthy people, although endemic disease is still widespread in some southern districts. But, as the report indicates, there is still no room for complacency. More effective measures are needed against tuberculosis, which, though not very common at present, may spread with the advent of civilisation and readier contact with the outside world. Much remains to be done in housing, diet, and social medicine; and the facilities for treating mental disease need to be extended. But it is unlikely that the Sudan will be able to afford much more direct expenditure on medical work than the present £E.500,000 a year, which is almost a tenth of the country's budget.

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Annotations

PLENTY IN THE MIDST OF STARVATION

THIS country bears no responsibility for the action taken, or not taken, by the United States, Canada, the Argentine, Soviet Russia, or other food-producing countries. What the governments of these countries decide is their own affair, not ours. But we are fully responsible for having demanded from world stocks, at a time of shortage, as much grain as was necessary to keep our calorie consumption at 95% of what it was before the war. With famine approaching in India, and the situation in British-controlled cities on the Continent causing grave concern, our rulers have been reluctant to ask the public to accept anything less than the 2850 calories it has been taking; which, as Dr. H. M. Sinclair [1] points out, is about the same as the full recommended dietary allowances of the United States National Research Council. How far the Government's new measures will reduce this figure is a matter of opinion. They have agreed that 200,000 tons of grain destined for the United Kingdom during April and May shall be diverted to other countries, but only on the assurance (or hope) that its place in our reserve stocks will be filled again from North America before long. Secondly, they are raising the price of bread by reducing the size of the 2-lb. loaf to 1¾ lb.—probably with the idea of checking waste rather than consumption. The only definite economy so far announced is a 15% reduction in the allocation of barley for brewing beer; and here it must be observed that the number of tons of cereals to be used by brewers in the year ending on Sept. 30 is estimated at 814,000.[2]

However the situation may appear through middle-class windows, Dr. Sinclair is no doubt right in saying that our per-capita consumption of almost all nutrients is now higher than before the war, the exception being fat. In his opinion the reduction by 100 calories per head, for which Sir Arthur Salter [3] appeals, "seems very reasonable and there is no evidence that it would prejudice health." Assuming that a reduction of this modest magnitude is unlikely to be attained by the measures so far taken, and by appeals to the public to avoid waste, what other means of economising in British consumption of millable grain are open to the Government?

The problem is partly technical and partly psychological. From the technical standpoint it should first be noted that it is ultimately the consumption of flour that interests us, not the consumption of bread alone: at least 10% of our wheaten flour goes to the manufacture of biscuits and confectionery, and a further 15% probably goes to the baking of pies, puddings, and so forth. If we are content to give less food to farm stock—which eventually means less home-grown meat, milk, or eggs—the extraction of wheat can safely be raised to 90%; indeed in theory it could be raised still higher, but at a certain point we should come up against the gastric or intestinal disturbances noted in the Channel Islands when 100% extraction flour was used during the occupation,[4] and these would make it necessary to provide special bread available on a medical certificate. Neither the raising of the extraction-rate to 90% nor the admixture of 10–15% of barley flour would present any great difficulty, though both are said to have been rejected because they would lessen the keeping qualities of the loaf. But if we take the second obvious step and begin to restrict the use of flour, either domestically or for the manufacture of biscuits and confectionery, we are entering an unknown field. For example, if we were to cut the flour allowance to manufacturers by half, it might become necessary to allocate their biscuits and manufactured cake entirely to the works canteens and institutions where these are at present much used; for the alternative would be general scarcity and a black market. The third possible step is, of course, the rationing of bread and flour, which would have to be treated as a single problem, for neither can be rationed by itself. The plan here would have to be a simple one: there is no time for complexities, and the housewife would either have to take the whole of her ration in bread or resign a proportion of it—up to a quarter perhaps—for an equivalent amount of flour. The object, naturally, would be to secure a fall in the amount of food purchased; and the risk is that this might lead to some decline in industrial production. Though schemes of differential rationing between various groups of the community are not too difficult to devise, nobody can tell how a given population will respond to such a scheme. The extent to which the allotted rations are merged within the family ration may be the extent to which the scheme is successful or is frustrated. In other words, even with differential rationing the total fall in calories may mean a fall in the calorie intake of industrial workers, whatever the intention of its organisers may be.

It is too late to imagine that, were it ever desirable, the people of Britain can be isolated from the emotional shock of famine; and in fact they are, quite rightly, beginning to suffer from an uneasy state of mind about food, which cannot be relieved by passing responsibility to the food-producing countries, saying "we'll ration if you will." Government policy has so far discouraged any attempt on the part of individuals to mitigate their uneasiness by self-denial; for there has been no reason to believe that the fruits of this self-denial would go to the places where they are needed. Moreover, it is difficult to deny oneself an extra slice when so many other people's dustbins contain discarded half-loaves. If the Government make it difficult to waste bread, and make it clear that what we save will be used directly to prevent starvation abroad, we shall all have more inducement to be careful.

1. *Times*, April 25, p. 5.
2. *Hansard*, April 17, col. 2686.
3. *Times*, April 16, p. 5.
4. See *Lancet*, 1945, ii, 569.

VASCULAR TUMOURS

THE view that many so-called angiomata are not new growths but represent local aberrations in the development of blood-vessels is based on the embryological work of Sabin [1] and Woollard.[2] The latter described three phases in the development of the permanent vessels of an extremity: (1) the earliest, in which the blood-vascular system is represented by a capillary network; (2) an intermediate, in which the number of vessels is reduced and the calibre of those remaining increased, without permanent arrangement of the direction of blood-flow; and (3) a final phase in which the vascular tree, both arterial and venous, is differentiated, and redundant units of the second phase are eliminated. Local arrest of these gradual processes may give rise to a wide variety of vascular anomalies whose structure depends on the stage of arrest, and which may retain in some degree the original direct communications between primitive arteries and veins. The life-history of these anomalies varies: some may at first grow with the child, but disappear in early childhood as the differentiating process in the "angioma" is completed; others may enlarge rapidly at about the age of puberty, possibly as a result of freer input by the feeding vessel or vessels. The effect of trauma also varies; occasionally, and especially if the trauma is associated with ulceration, the anomaly may disappear, possibly by a process of local thrombosis; more often local injury leads to rapid enlargement of the anomaly, perhaps through the establishment of more numerous and wider arterio-

1. Sabin, F. R. Contributions to Embryology, Carnegie Inst. 1917–18, vols. VI–VII, p. 61.
2. Woollard, H. H. *Ibid*, 1922, vol. XIV, p. 139.

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venous communications. In time the anomalous blood-vessels become formidable masses, presenting difficulties of great complexity in treatment and even necessitating amputation of an extremity. In peace-time, reports of such cases (e.g., that of de Takats [3]) have not been numerous; the majority have been of the "cirsoid aneurysm" type. During the recent war the effect of trauma on "angiomas" has received more attention, both in the United States [4] and in Britain, where Learmonth [5] discussed the subject at the Royal Society of Medicine on March 6. Recent reports have described damage to angiomas from such miscellaneous types of injury as a "knock" on the wing of an aircraft, the shock to a foot caused by jumping into a slit-trench, and the repeated recoil of a rifle. Although the number of recorded cases of activation of vascular tumours rose in the war years, the increase may not be absolute, because such cases naturally gravitated to special vascular centres, where they were closely studied. Nevertheless practitioners will do well to have such conditions in mind; when diagnosed early, the majority lend themselves to surgical removal, but delay in treatment may mean loss of the opportunity for conservative measures, may lead to large and perhaps hideous deformities, and may even endanger life as a result of furious bleeding from some trivial injury to the mass.

RESTORATION TO WORK

In our last issue Dr. Harold Balme discussed the scope of reablement schemes in coming years. Working from figures for the United States, supplied by the International Labour Office, he estimates that there are probably well over 3 million people of working age in Great Britain with some form of disability for which reablement is needed; and that over 2 million will need advising about occupations in which they will not be handicapped. In addition 300,000 will need special training for a new occupation, and 100,000 will require sheltered conditions of work. A great expansion of reablement departments is inevitable, he considers, in addition to those now running in more than 300 civilian hospitals. He explained that under the new Disabled Persons Act large numbers of disabled are now applying for registration at employment exchanges, and thus being interviewed for the first time by the wrong man in the wrong place: they need medical and industrial advice first.

It is not easy to decide what facilities will actually be needed, or how numerous centres must be. A quantitative estimate made by the Liverpool Hospitals Advisory Committee was reviewed in our issue of April 20, and the Medical Advisory Committee (Scotland) has just published a report which reviews the needs of Scotland in more general terms.[6] They note that the practice at different hospitals varies widely, that the liaison between hospital and family doctor is weak, and that convalescent homes though numerous give little more than board and lodging in pleasant surroundings. The large Emergency Medical Service country hospitals have developed occupational therapy, physical training, games and recreation of various kinds, and since 1943 a special experiment in reablement has been carried on for resident patients at Gleneagles. This "fitness centre," set up at the request of the Ministry of Fuel and Power and the Miners' Welfare Commission, was intended first for miners, but now accepts a wider range of patients, referred from hospital, or sometimes by their own doctors. Though Gleneagles, under the direction of Dr. P. S. Macleod (whose report to the committee appears as an appendix to the report), has done important work in developing methods of improving physical fitness, the committee feel that it has not been as successful in hastening return to work as was hoped. This is partly due to inadequate selection of cases for admission, partly to the influence on patients of prospects of compensation, and partly to special difficulties of the mining industry, and to the policy—which the committee think mistaken—of segregating miners. There are also non-residential centres in Scotland, notably those established in 1935 by the Lanarkshire Orthopædic Association. The committee assume that reablement will never be necessary for patients suffering short illnesses, for those with advanced incurable disease, and for many elderly patients; but that about a quarter of the patients in medical wards would benefit by maintenance exercises and diversional therapy. The causes of chronic incapacity, they point out, are more commonly medical than surgical, and a full scheme should provide for the resettlement of such cases. They note the important work done by the disablement rehabilitation officer (D.R.O.) in helping patients to get back into industry, and the value of his keeping in close touch with the hospital, and on the useful part taken by the almoner. In addition, the industrial medical service must of course be a pillar of any scheme of reablement.

In developing the service, continuity of supervision during the whole of treatment and restoration to work must be assured. They advise that a non-residential centre should be established in connexion with the large general hospitals of the principal cities and big towns, and suggest that E.M.S. hutted hospitals with reablement facilities should be maintained and developed. A few convalescent hospitals with an organised scheme of reconditioning would be useful for "some forms of heart disease and digestive disorders and in recuperation after child-birth." One large residential centre, capable of dealing with about 200 patients from all sections of the community, might, they think, be provided and used for research. As practical rules for the running of a reablement centre, they suggest that control should be in the hands of a medical director under whom the auxiliary staff work as a team; doctors and surgeons referring cases should have ample opportunity to discuss them with the director; and the progress of patients should be reviewed and their programmes adjusted at weekly meetings at which the director presides.

THE BIOLOGY OF DEATH

In opening a series of postgraduate lectures at Edinburgh Royal Infirmary on April 23, Prof. F. A. E. Crew, F.R.S., took the view that "death whene'er it comes must come too soon." Mankind at all times in history has tried to postpone death, believing that life, in spite of its difficulties, disabilities, disappointments, and disillusionments, is preferable to the unknown and even to the most attractive varieties of heaven that men have invented. Much of the theology and philosophy relating to the existence of an after-life is linked with the universal self-interested demand for immortality and the desire for eternal youth. So far, he said, science has not found out what happens to the individual after death, but the act of dying is a phenomenon which can be studied by the biologist and is part of the general problem of the nature and causes of ageing. Wide variations occur in the life-span of different species, but within the same species the ages at death are distributed in an orderly fashion capable of exact mathematical description. Unicellular, as distinct from multicellular, organisms do not die natural deaths when maintained in an optimum environment; they pass to a new life by the process of simple division. The individual cells of a multicellular body are in the same sense potentially immortal. It seems, therefore, that the causes of

3. de Takats, G. *Surg. Gynec. Obstet.* 1932, **55**, 227.
4. Elkin, D. C. *Ann. Surg.* 1944, **120**, 284.
5. Learmonth, J. R. *Proc. R. Soc. Med.* 1946 (in press).
6. Report on Rehabilitation, 1946. Edinburgh: H.M. Stationery Office. Pp. 35. 6*d*.

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senescence and death should be sought among the differences which distinguish multicellular from unicellular organism—differences arising mainly out of the delicate interdependence of cells and tissues that has grown with the evolution of the specialised body. Death is the price that the multicellular organism must pay for greater efficiency based on differentiation, and is merely the abrupt cessation of individuality as the species continues.

There appears to be an inherent vitality characteristic of the species with which its individuals are quantitatively endowed and which they use up at different rates according to their relative efficiency in food utilisation and energy transformation. From an analysis of death-rates Professor Crew put forward the following deductions and speculations for the human species. (*a*) Although there is a higher birth-rate of males, this is offset by the operation of a sexually selective mortality which is especially active in infants, and at all ages the male seems more prone to illness and more easily removed by death. (*b*) Different organ systems are of unequal biological worthiness. The skeletal, cutaneous, and endocrine systems appear sound in design and efficient in function; the circulatory, respiratory, alimentary, and central nervous systems are relatively poor. The organ systems associated with most deaths in early life are those in constant communication with the external world, and among the greatest triumphs of medicine has been the protection of infant life from diseases gaining entrance to the body by the respiratory and alimentary tracts. (*c*) The fall in infant mortality which will continue as social medicine develops will mean that more people will pass into the adult and senescent age-groups. Medicine must therefore concern itself more and more with the repair of degeneration, aiming to prolong useful individual life, especially between the ages of 55 and 65. For this it must know more of the nature and causes of ageing, and must learn the secret of the resistance to disease-provoking agencies that characterises the young.

COLD TREATMENT OF BURNS

LOCAL loss of plasma plays a great part in determining the course of a thermal burn, especially in the first 36 to 48 hours, provided the burn has been severe enough to damage the capillaries but not so severe as to cause coagulation and necrosis of the tissues. Treatment aims at replacing the plasma lost from the circulation of the burned area, by transfusions of plasma or serum, and by the restriction of fluid loss in the burn by the application of pressure dressings,[1] the degree of hæmoconcentration revealed by the hæmatocrit or hæmoglobin reading being used to control the plasma replacement.

Local pressure lessens œdema by increasing the effective tissue tension, which reduces the escape of plasma through the capillary walls. Any treatment which would reduce the blood-flow would also tend to reduce the formation of œdema. In 1936 Rose[2] reported that the treatment of burns by immersing the whole body in cold water gave good results particularly in the earlier stages, presumably by reducing the local blood-flow. Courtice[3] has now reported a series of experiments in which the effects of local temperature on fluid loss, hæmoconcentration, plasma non-protein nitrogen and plasma protein levels, local blood and lymph flow, blood-pressure, and mouth temperature were determined in rabbits, dogs, and goats whose limbs had been scalded. His results show that when the scalded area is cooled by immersion in ice-water, local blood and lymph flow are diminished, local œdema and hæmoconcentration are correspondingly reduced, and disturbances in blood-pressure, plasma non-protein nitrogen, and plasma protein concentrations are less. These improvements can also be obtained if the application of cold is delayed for 2 hours after the infliction of the burn. The effectiveness of plasma transfusions was greater in the cold-treated animals, and a smaller volume of plasma was required in that group.

Courtice believes that his experiments show that the primary factors in the effect of local temperature on fluid loss are the blood-flow and the state of the capillary wall. The lymphatics and the osmotic balance at the capillary wall are normally able to control the amount of tissue fluid and prevent the formation of œdema. When the capillary wall is damaged and the normal osmotic equilibrium is thus disturbed, the lymphatics are the only channel through which the tissue fluid can be removed. In a burned area they cannot drain away all the fluid formed, and œdema results. Cooling the burned part, by decreasing blood-flow and probably also the capillary pressure, reduces œdema formation. Cooling also lessens the protein concentration of the lymph, suggesting that the permeability of the capillary walls has been reduced, possibly by contraction. It was also found, provided the general body temperature was maintained, that application of cold for 48 hours had no appreciable effect on the healing of the burn. The reduction of local œdema will not only help to prevent circulatory collapse, but will also possibly improve the transfer of oxygen to the cells which still survive in the burned area and whose metabolism may be increased by injury. Webster and colleagues,[4] discussing immersion foot, believe that the intense tissue œdema is an important factor in impeding oxygenation.

Cold therapy has been successfully used in a number of conditions, and if Courtice's results, which are comparable to those obtained by using pressure dressings on experimentally burned animals, can be successfully applied to man it may prove of value in the treatment of limb burns. Not only does cold relieve pain, but it also helps in controlling infection.[5] The use of a dry cold apparatus, similar to that described by Bigelow and Lanyon,[6] would permit continuous observation of the burned limb without local manipulation.

1. Cope, O., Rhinelander, F. W. *Ann. Surg.* 1943, **117**, 915. Cameron, G. R., Allen, J. W., Coles, R. F. G., Rutland, J. P. *J. Path. Bact.* 1945, **57**, 37.
2. Rose, H. W. *Northw. Med., Seattle*, 1936, **35**, 267.
3. Courtice, F. C. *J. Physiol.* 1946, **104**, 321.
4. Webster, D. R., Woolhouse, F. M., Johnston, J. L. *J. Bone Jt Surg.* 1942, **24**, 785.
5. Crossman, L. W., Ruggiero, W. F., Hurley, V., Allen, F. M. *Arch. Surg., Chicago*, 1942, **44**, 139. Mock, H. E., Mock, H. E. jun. *J. Amer. med. Ass.* 1943, **123**, 13.
6. Bigelow, W. G., Lanyon, E. C. G. *Brit. med. J.* 1944, **1**, 215.

On Active Service

AWARDS

O.B.E.

Lieut.-Colonel P. C. DUTTA, I.M.S.
Lieut.-Colonel W. J. L. NEAL, M.B., I.M.S.

M.B.E.

Major B. L. KAPUR, M.B., I.M.S.
Major H. S. MANNI, I.M.S.
Captain T. C. BOSE, M.B., I.M.S.
Captain P. V. RAMANIAH, M.B., I.M.S.
Captain B. D. P. RAO, M.B., I.M.S.
Captain JOHN SUTHERLAND, M.B., R.A.M.C.

MENTIONED IN DESPATCHES

R.A.M.C.

Major P. A. M. VAN DE LINDE.
Captain R. H. S. LEE, M.B.E.

I.M.S.

Lieut.-Colonels. — K. F. ALFORD, B. CHAUDHURI, O.B.E., G. D. MALHOUTRA, O.B.E.
Majors.—L. FEINHOLS, A. C. GLENDINNING, G. A. GRAHAM, S. A. HASAN, J. O'NEILL, M. N. SARDANA.
Captains.—A. M. BEST, B. L. EVANS, N. K. MEHRA, N. S. PILLAY, A. STRACHAN, B. N. SUDAN, A. K. THOMAS.

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Special Articles

PULMONARY TUBERCULOSIS AMONG BRITISH PRISONERS IN GERMANY

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1940

DURING the first year after the fall of France there seems to have been no general policy instituted by the Germans for the treatment of pulmonary tuberculosis among British prisoners-of-war. Many of these lay sick in their camps or camp hospitals and were rarely given specialist attention. Some are known to have died in the XXA and XXB areas and no doubt, when the full records are available, other deaths will be discovered. On the other hand, some were transferred to IIIA Tangerhütte, a mixed hospital where British, Poles, and a few French received treatment of a kind. Here relations between Germans and prisoners-of-war were apparently very strained, while staff and food were inadequate. Food parcels arrived from England only haphazardly, actually only a few at Christmas. Deaths seem to have taken place here after an average of only 2 months in hospital, indicating very acute disease processes besides probably inadequate care.

1941

Early in 1941 the Swiss Embassy, on the suggestion of various camp leaders, approached the German High Command with a request that British tuberculous patients should be brought together to a central hospital where they could enjoy specialist treatment and advice. During the latter part of June the British patients lying at Tangerhütte were transferred to Rez. Laz. Schmeckwitz, Stalag IVA (near Camenz), which had been opened up shortly before and was staffed by 3 French doctors and some French orderlies. Schmeckwitz appears to have been the ideal place for a war prisoners' sanatorium. The rooms were mostly small, with 4 beds or so each and hot and cold running water and looked out onto agreeable surroundings. Around the building, which resembled an old country house constructed on sound and hygienic lines, there was a large park, where the patients could sit or stroll about. The maximum of freedom seems to have been allowed there, and the patients were undoubtedly happy. Food was good, though Red Cross parcels were still inadequate. All nationalities, especially French and British, were accepted as patients; but, as only 150 beds were available, it soon became apparent that a larger hospital was required.

At Winterberg, IVB, there were also at this time tuberculous British patients from various parts of Germany. Apparently they were being accommodated there temporarily, as the equipment was inadequate for the care of consumptives—e.g., the French doctor who was looking after the British, French, and Serbs there, Dr. Blondeau, had to construct his own pneumothorax machine. To balance this, there was a good morale in the hospital, and the food was fairly satisfactory. Red Cross parcels were coming in there well at the time. Schmeckwitz and Winterberg being too small to take all the tuberculous cases, and as it was seen that Schmeckwitz would make an excellent convalescent home for German soldiers returning from the Russian campaign which had just started, the authorities looked for another place in which to settle the British patients. There had been talk at one time of moving to the Saxon Switzerland, but how much of this is hearsay cannot be established. The spot ultimately chosen was Königswartha, east of the Elbe and rather north-east of Dresden, which had been hitherto a war prisoners' hospital for infectious diseases.

In September, just after the fiasco of the Rouen repatriation, Schmeckwitz staff and patients moved to Königswartha and were followed in December by Winterberg patients.

Königswartha was obviously a sad disappointment to the Schmeckwitz patients. Accommodation consisted of old stone buildings and wooden barracks; double-tier beds were general. Sanitation was poor (cesspits which required pumping out) and water-supply inadequate; baths were old and rusty, and hot water was rarely available; and so on. On the other hand, the food was good: there was plenty of fresh vegetables; the extras supplied by the German authorities were as high as anywhere in Germany, with white bread, milk, eggs, potato purée, porridge, tinned fruit, salad, &c.; and the bread and margarine ration appeared larger than in the camps. Further, there reigned in the camp an atmosphere of good will and rest. The Chefartz, Dr. Rindfleisch, was obviously interested as a doctor in the patients, and was certainly popular with them; he also had enough command of English and French to flatter the men, without knowing enough to discuss difficulties in anything but German! He had a sound knowledge of tuberculosis, tending in his treatment to be somewhat conservative but never allowing himself to be dogmatic. He was also willing to impart his knowledge to the foreign doctors, and offered to give lectures on the cases under treatment at the hospital. But the interest shown in his patients clinically did not seem to express itself very effectively in administration. No real attempts were made to improve sanitation and hygiene, and the usual questions of overcrowding and inadequate staff were never really solved under his tutelage.

Thus, at the end of 1941, 18 months after the fall of France, general conditions may be briefly summarised as follows:

(1) The *hospital* as I have described it.
(2) *Staff* almost wholly French, inadequate in number, with no British medical officers or orderlies, living in grossly overcrowded conditions.
(3) *Equipment.*—X-ray and artificial-pneumothorax apparatus, little else. No efficient sterilisation apparatus.
(4) *Patients* included 130 British, mostly from France. Pulmonary-tuberculosis processes fairly acute, with a high death-rate among British, and a higher among Serbs, who appear to have a poor natural resistance to tuberculosis, especially in the poor conditions of captivity. All patients in double-tier beds and grossly overcrowded. Because of bad organisation and inadequate staff, patients were looking after themselves, doing even their own cooking. Rest periods in abeyance.

1942

In spite of all efforts, general conditions in Königswartha remained much the same thoughout the year, but equipment, staffing, organisation, and treatment were considerably improved. *Equipment* was improved in the following respects:

(1) The arrival early in the year of a set of pleuroscopy and cauterisation instruments, thanks to the energetic representations of Blondeau. This French Medical-Captain combined a sound knowledge of tuberculosis with a magnetic personality, and British prisoners-of-war owe him much.
(2) A cinema apparatus was procured, a wonderful contact with the outside world for those whose outlook is bounded by barbed wire, but at this stage only the dying were absent from the weekly show.
(3) Occupational therapy parcels began to arrive from the invalid-comforts section of the Red Cross. Later in the year, under the wise direction of Padre Fraser, this proved its true worth and was of inestimable value, in spite of original reluctance of the patients (male) to do such work (female).

Staff.—Once Königswartha was established, application was immediately made for British medical officers and orderlies. This was approved in principle by the German authorities and became operative from February.

In February, the first British doctor turned up: Captain A. J. King, A.A.M.C. Luckily for the hospital, Dr. Blondeau and Captain King got on excellently together and succeeded in forming the basis of the team that was later to be built. At the beginning of March, 4 British doctors arrived from Lamsdorf (Captains G. Holt, N. Allen, N. R. Godby, and M. Mayrhofer) and were immediately pressed into service; 2 British order-

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lies, volunteers for the work and fresh from voluntarily nursing typhus, accompanied the 4 doctors and were followed shortly by 7 others. To these pioneers one must pay very high tribute; they were badly housed and overworked, but they stuck to their work through all these bad times and made a great change in the standard of the treatment and nursing of the sick.

During these first months of 1942 the British staff was further increased by the arrival of Major R. Mackay, Padre Gordon Fraser, and Lieuts. Ian Macfarlane (arrived actually in November, 1941) and M. Fairlie (both of the Black Watch). The 2 last have an excellent command of languages, especially Macfarlane, and by speaking not usually with the tongues of angels imposed British ideas on reluctant Germans. Mackay did not stay long but, being of field rank, was able to put through some very necessary reforms: separation of positives from negatives, and so on. He also got permission from the British Red Cross for food parcels to be given to very ill Poles, French, and Serbs, thus turning the scale for many of them.

Soon another 10 orderlies arrived, though the total was still inadequate. The Germans always considered an overall figure of 6–8 orderlies per 100 patients sufficient to run a hospital. We generally managed to disabuse them of that idea.

Early in August Lieut.-Colonel L. E. Le Souef, A.A.M.C., and Captain F. Gallash arrived from IXB, Dieburg, to find many of their unit already working in Königswartha. In a short while Le Souef took over the running of the hospital and, with his rank, his professional quality as a surgeon, and his forceful personality, proved a tough nut for the Germans to crack.

Administration and *organisation* were tackled at once; discipline reappeared; rest periods, &c., were enforced; and, generally, Königswartha showed signs of becoming a real hospital.

Treatment, too, was improved (see table v). Artificial pneumothorax and section of adhesions were by now almost routine; phrenic crushes were now possible; and the first operation (on an anal fissure) was carried out with much pomp and ceremony.

Drugs at Königswartha were fairly easily available, as that place was the distributing centre for various hospitals in the region, a Stabsapotheker being in charge.

The Germans, always susceptible to rank, now began to listen to the complaints of the S.B.M.O. (senior British medical officer), especially as a long written document was carefully prepared, and copies were sent both to the Swiss legation as protecting power and to the German authorities.

The annual "Home by Christmas" slogan having again proved to be false, the winter passed without incident.

1943

In February action followed the petition sent in by the S.B.M.O. An impressive commission of higher ranks turned up from the German High Command and made a thorough inspection of the hospital, paying particular attention to billets and lavatories; the bathroom was also condemned. The S.B.M.O., invited to a round-table conference after the inspection, was assured that his complaints would be given redress, and all those present agreed with the German colonel in charge of the commission. The area authorities had, orally at any rate, to be quashed concerning double beds for tuberculous cases; this matter was settled once and for all at the meeting.

The promised action came quickly: on March 3 and 9 the hospital moved en bloc to Elsterhorst, some fifteen miles from Königswartha (see fig. 1), taking the staff and some of the equipment, transport being afforded by train, buses, and lorries. The general hospital at Elsterhorst was transferred to Königswartha, and, as the barracks there were nearly completed to form a 600-bed hospital, the other general hospital for prisoners-of-war at Gnacshwitz was closed down. The transfer to Elsterhorst was at first, if a blessing, a blessing in disguise: doubled-wired fences, watch-towers, and searchlights, dust, and sand, apart from the habitual initial difficulties always encountered in organising a new establishment. There was, however, a football field inside the camp (fig. 1), which, although not nearly so spacious or smooth as that in Königswartha, was within

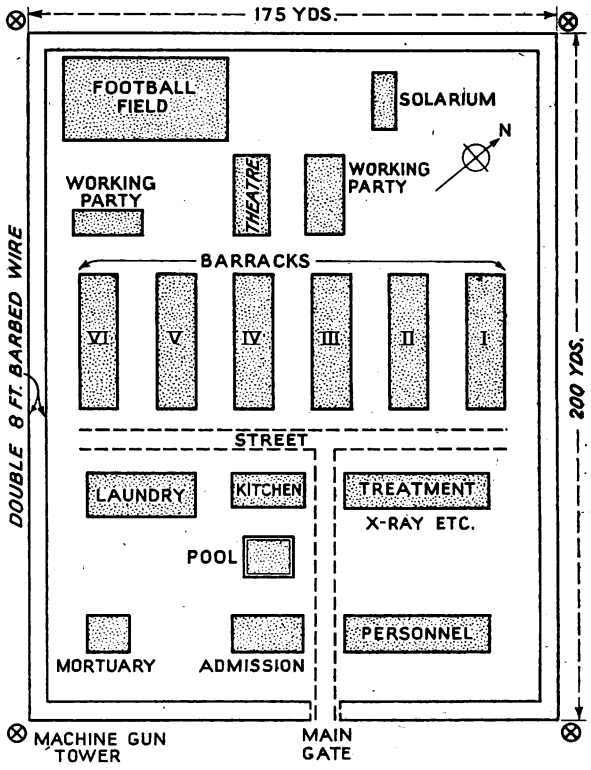

Fig. 1—Plan of Elsterhorst. Layout is typical of the few hospitals built by the Germans specially for treatment of prisoners-of-war. Each barrack accommodated 70-80 patients, all in single beds. Barracks I and II were wooden, the rest of stone. Each barrack had kitchen, treatment-room, room for M.O., and various small wards, besides a large 20-bed ward at each end. After D-day security regulations were such that any movement whatever outside buildings after 9 p.m. curfew was met by bullets, without challenge.

the fence, and therefore afforded great joy to the patients looking on. The theatre barrack was disappointing, compared with the little stage which had been made at Königswartha, but improvements were also made there in due season. The balance was obviously in favour of the bed patients: the rooms were smaller, and most of the barracks were of stone; there were good bathing facilities, though improvements had also to be made here; there was a stove in each barrack as well as in the main kitchen; and there was a proper flushing system in each lavatory.

The operating-theatre was definitely an improvement on that in Königswartha and was to be used far more than it, for in this hospital one barrack was reserved for officers sick from the French Oflag, besides barracks for the tuberculous patients. This was Oflag IVD with 4000 to 6000 officer prisoners, who had earlier made themselves responsible for procuring from France adequate operating-theatre equipment, including scialytic lamp, sterilisers, &c.

On the debit side it was noted from the first that the rations were not so good as in Königswartha; there had indeed latterly been a tendency in Königswartha to reduce the extras, but in Elsterhorst this was carried to its limits right from the beginning: milk was granted to every patient, but there were no eggs, no tinned fruit, and no salad for them. White bread was much scarcer, and could often be referred to as green bread, as mould had taken its share before the patients had a chance. There was a shortage of green vegetables. The cooking facilities were not used to their full advantage at first, and indeed it took time before we could get enough cooks from various Stalags to cover our needs.

The atmosphere of the camp was considerably altered from that of Königswartha: more formally military, with no idea of welcome in the air. Security in its more daily forms was sticky, and there were small troubles whose clearing necessitated time—e.g., getting the cinema apparatus over from the Oflag, for the machine at Königswartha naturally did not come with the patients. Medical interest in the patients ceased forthwith from the

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other side, and patients were only considered from the point of view of working-hours. However, improvements did appear little by little. The cooks we had asked for came at last: a team which, though having the usual idiosyncrasies of culinary personnel, worked exceedingly hard and honestly for the welfare of the patients.

In the operating-theatre great attention was paid to the development of an aseptic technique; and, this having been proved satisfactory by several knee-joint operations in the summer, a three-stage and a two-stage thoracoplasty were done. These patients were repatriated in October, and the two-stage was completed in England.

The greatest summer problem was a water shortage, a problem which was never satisfactorily solved.

Acting Major M. Wallis, R.A.M.C., was now second in command. Captain Blondeau was repatriated and replaced by Medical-Capitain Chon, another energetic Frenchman, whose thoracoscopic work was as good as his judgment was sound.

During the summer things went from bad to worse in the relations between the prisoners and the German authorities; starting from small beginnings, it gradually assumed large proportions, involving matters of principle. Finally, after the strongest written and oral representations had been made, the German medical superintendent and the senior German N.C.O. were removed.

The October repatriation went off very smoothly, though it was regrettable that no orderlies from this hospital went on the train to look after our patients. Unhappily also, some 30 merchant navy and civilians, long since passed by the Mixed Medical Commission for

TABLE I—DEATHS AND SURVIVALS

Country of origin	Admissions	Deaths	Death-rate (%)	Survival-rate (%)
U.K.	749	76	11·0	89·0
Canada	22	1	4·5	95·5
Australia	19	2	10·5	89·5
N. Zealand	22	2	9·0	91·0
S. Africa	16	1	6·0	94·0
India	99	25	25·3	74·7
Cyprus and Palestine	37	4	10·8	89·2
Average			11·5	88·85

Figures from tuberculosis group of hospitals only, thus too low. Some figures too small to be of value.

repatriation, were left behind and waited another year before being sent home.

The departure of so many old cases was a great relief to the hospital: it gave a breathing-space to the orderlies who had been working hard for a long spell; it afforded the opportunity of cleaning out the barracks thoroughly.

Parcels, private and standard, were coming in regularly, and the Y.M.C.A., thanks to the amazing initiative of Mr. Christianssen, had proved a real practical help to the hospital in all sorts of ways—records, gramophones, make-up—supplementing the excellent work of the invalid-comforts section.

Urgent appeals were made to speed up the serial radiography of the British in this area, which had long been overdue, considering that many of the working parties were in mining areas, and attempts were made to get British medical officers touring the various working parties at regular intervals of a month. After much negotiation and many heated interviews, doctors were put out to working parties (though not immediately in every case, and the monthly visits were not assured), transport difficulties were considerably reduced (after a particularly disgraceful transport from XXB and XXA), and serial radiography was set in motion.

Late in the autumn of 1943 it became the policy of the German authorities to limit admissions to this hospital to British, but after the first repatriation there were considerable numbers of other nationals—French, Serbs, Poles, and Italians. During the spring of 1944 most of them were sent away to other hospitals, especially to the notorious Muhlberg. Conditions there had long been

TABLE II—INCIDENCE OF ACTIVE PULMONARY TUBERCULOSIS (PLEURISIES AND FIBROTICS EXCLUDED)

Country of origin	No. of prisoners	Active pulmonary tuberculosis				
		Diag. in		Incidence per 100	Probable additional cases in Germany	Probable incidence per 1000
		Germany	England			
U.K. ..	117,942	601	300	7·6	150	8·8
Canada ..	6340	18	32	7·8	4	8·5
Australia	6341	15	12	4·2	4	4·9
N. Zealand	6831	18	20	5·5	4	6·1
South Africa E	9183	8	16	2·6	2	2·8
South Africa NE	1172	4	14	15·3	2	17·0
Cyprus and Palestine	3303	32	*	10+	6	*
India ..	10,742	89	161	23·3	20	25·0

* = not available.
E = European. NE = Non-European (Bantus, &c.)

Incidence: probably too low, as cases were certainly lying in various hospitals and camp hospitals all over Germany. In one case at least, British medical officer responsible that these were not sent to Elsterhorst—patients there had only bed, rest, &c. Suggested reasons for high incidence: (1) first six months of P.O.W. life; (2) bad housing and overcrowding; (3) long work hours, inadequate clothing changes; (4) lack of hygienic facilities—clothes and bodies; (5) poor rations, absence of vitamins.

the subject of strong complaints, and only in 1945 were single beds allowed for patients with pulmonary tuberculosis, and then, I believe, for British and U.S.A. patients only.

1944

In May the second repatriation took place. With the patients went Major J. D. Palandri and 15 British sanitators, including some very faithful retainers. They gave way to a younger lot, who managed to maintain the tradition in honourable manner. Some changes took place in the British staff, in that certain sanitators had been exchanged for others from working parties, thus bringing in new blood and preventing men from staying too long in contact with infectious cases.

At Elsterhorst, all staff and orderlies were screened every three months, filmed, and had their blood-sedimentation rate tested if necessary. So far as I am aware, only 1 case of pulmonary tuberculosis developed among orderlies, and that in a man who, after some months in Elsterhorst, was for more than a year medical orderly to a working party.

In May also both Lieut.-Colonel Le Souef and the German superintendent were transferred elsewhere. Their

TABLE III—TYPES OF PULMONARY TUBERCULOSIS (ROUGHLY CLASSIFIED)

Total cases ..	1003	Miliary ..	11
Fibrocaseous ..	331	With cavities ..	308
Ulcerocaseous ..	127	Fibrotic (inactive) ..	200
Mixed ..	189		

Sites affected

Apex only ..	407	Unilateral: rt ..	273
Above hilum ..	529	Unilateral: lt ..	188
Below hilum ..	67	Bilateral ..	489
		Not stated ..	53

work had become associated in the curious German mind, and it was decided to kill two birds with one stone! When Colonel Le Souef left, he left something which had been well worth doing: he had succeeded in making Elsterhorst probably the best war prisoners' hospital in Germany, for the number of patients it harboured. With its practised staff, its fine cooking facilities, and its good results, it remained a monument to good work done in the service of others.

* * *

Such was the state of affairs when I reached Elsterhorst as S.B.M.O. on June 1—a smoothly-running machine, reasonably contented patients and staff, and a high morale. My arrival coincided with that of a new German medical superintendent, Major Fritz, a middle-aged man combining all the worst faults of a thoroughly bad doctor with those of a Nazi. (The vast majority of German doctors under the age of about 35 were Nazis first and doctors a very long way afterwards. One became

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completely disillusioned about the alleged high standard of German medicine.)

Soon the hospital filled again, and we were favoured with a few visits from German tuberculosis specialists. Their interest, however, was not in the sick, the adequacy of our treatment, &c., but in whether or not the patients could be discharged to work in mines, railways, roads, &c.

In September a further 200 were repatriated, but were sent off without British medical officers or orderlies. Several are known to have missed refills and to have over-exerted themselves en route, and several died soon after arrival in England. We were visited by the Mixed

TABLE IV—TREATMENT AND RESULTS OF ADHESION SECTIONS (BRITISH ONLY)

Conservative	653	Pleuroscopies only	16
A.P.T. rt or lt	339	Pleuroscopy—	
A.P.T. bilateral	49	with adhesion section	129
A.P.T. failed or abandoned	44	with section repeated	32
		Phrenic crushes	35
		Thoracoplasties	4
Results of adhesion sections		*Complications after adhesion sections*	
Total collapse	42	Effusion (remaining sterile and absorbed)	19
Complete lateral	108	Empyema	20
Incomplete	22	Hæmorrhage	1
		Deaths	0

International Medical Commission in October. Their work on this occasion was greatly simplified as regards numbers to be examined, as it was now competent for German medical superintendents to certify all patients with positive sputum as suitable for repatriation. On the other hand, the Commission, naturally dealing only with negative cases, had a much more difficult task but generally gave doubtfuls the benefit of the doubt, to our great satisfaction and corresponding (and openly expressed) German disgust.

1945

In January, 1945, the 4th and final repatriation took place. Nearly 300 patients were sent off, and, although many were very ill, no British medical officers or orderlies were allowed to accompany them. This repatriation was a godsend to the hospital, for in February, in view of the rapid advance of the Russians and in spite of our protests, the Germans decided to evacuate Elsterhorst. Thereupon all remaining British and American patients and staff, a total of 150, entrained in cattle trucks and after 8 days' travelling reached Hohenstein-Ernstthal, near Chemnitz, approximately 100 miles to the west. The hospital was desperately dirty and badly organised, and housed ultimately some 900 patients and staff; only a minority had pulmonary tuberculosis. A busy 2 months followed, reorganising and cleaning up, but the welcome arrival of the U.S. 3rd Armoured Division on April 14 speedily put an end to these worries.

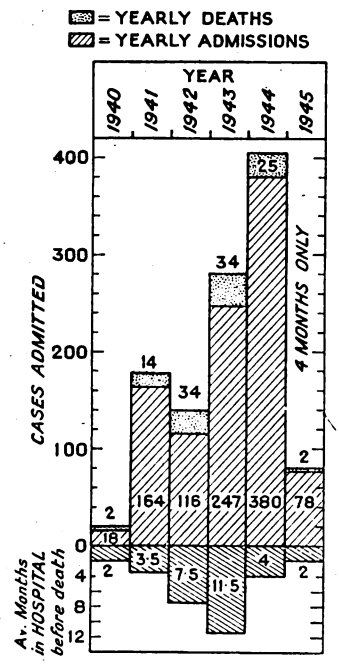

Fig. 2—Admissions, deaths, and lengths of stay before death.

Case-records

It is estimated that during the years under review some 2000 cases of pulmonary tuberculosis among Allied prisoners-of-war passed through these hospitals alone. In Elsterhorst the proportion of British rose steadily, as a result of German policy, so that by the summer of 1944 British patients comprised 99% of the total. Among the 2000 were some 1230 British plus a handful of United States troops, and in

TABLE V—RESULTS OF TREATMENT AS ESTIMATED ON REPATRIATION OR DISCHARGE

Result	Conservative treatment		Active (A.P.T., &c.)	
	No. of cases	Average stay in hospital (months)	No. of cases	Average stay in hospital (months)
Improved	194 (28·17%)	9	185 (47·65%)	9
In stata quo ante	427 (65·39%)	3½	176 (45·36%)	6
Worse	32 (6·44%)	13	27 (6·99%)	12

Improved = { Negative sputum after original positive. Normal or only slightly increased B.S.R. Increased weight.

spite of German orders to the contrary it was found possible to keep brief records of this 1230. These records consisted of (*a*) condition on admission (sputum, blood-sedimentation rate, weight, radiographic finding), (*b*) treatment, and (*c*) condition on discharge, as under (*a*).

Tables I–V, and fig. 2, analyse broadly the 1003 cases of active pulmonary tuberculosis among the 1230 British. Under the somewhat unfavourable circumstances it was quite impossible to bring back full case-records of all.

Table VI gives the names of officers who took part in the work.

TABLE VI—OFFICERS ASSOCIATED WITH THE WORK

British Medical Officers at Elsterhorst and earlier Hospitals

		1942	
A.A.M.C.	Capt. A. J. KING	Feb. 3	until liberation.
,,	Capt. N. R. GODBY	Mar. 3	,, ,,
R.A.M.C.	Capt. N. ALLEN	,, 3	repatriated Oct., 1943.
A.A.M.C.	Capt. M. MAYRHOFER	,, 3	to Sudetenland, 1943, until end.
,,	Capt. G. HOLT	,, 3	until Oct., 1944.
R.A.M.C.	Major R. MACKAY	Apr. 25	repatriated Oct., 1943.
,,	Capt. H. WYKES	May 12	to working party, Oct., 1944.
A.A.M.C.	Lieut.-Col. L. E. LE SOEUF	Sept. 10	to Annaberg, May, 1944.
,,	Capt. F. GALLASH	,, 10	repatriated
		1943	
R.A.M.C.	A/Major M. WALLIS	Feb 21	until liberation.
A.A.M.C.	Major J. D. PALANDRI	Sept. 2	repatriated 1944.
S.A.M.C.	Capt. S. J. CAWOOD	Nov. 10	until liberation.
N.Z.M.C.	Capt. D. C. CLAY	,, 10	to working party, Nov., 1944.
		1944	
R.A.M.C.	Capt. A. L. COCHRANE	Mar. 4	to working party, Nov., 1944.
N.Z.M.C.	Lieut.-Col. W. H. B. BULL	June 1	until liberation.

British Officers at Elsterhorst

Lieut. IAN MACFARLANE (Black Watch)	February, 1942 ..	to Königswartha, October, 1944.
Lieut. M. FAIRLIE (Black Watch)	May, 1942 ..	until liberation.
Capt. GORDON FRASER (Padre 51 Div.)	May, 1942 ..	,, ,,
DUNCAN CATTERALL (F.A.U.)	May, 1942 ..	,, ,,

French Medical Officers

Med.-Capitain BLONDEAU	1941 ..	repatriated 1943.
,, ,, CHON	1943 ..	until liberation.

General Observations

MASS RADIOGRAPHY

I have no doubt that the Germans, if they write medical reports of this war, will emphasise the care and attention given by them to prisoners, especially those with pulmonary tuberculosis, and will make much of their early diagnosis by mass radiography. The earliest was done, as far as I am aware, in 1942. The interpretation of these miniature films appeared to be badly done, many obvious cavities being missed. Worse still, when a diagnosis of active pulmonary tuberculosis (often with cavities) was made, very often 6–9 months elapsed before the men were sent to hospital for treatment. Moreover, doubtful cases were often not filmed or further investigated until many months had elapsed. We were informed by the Germans that they could easily radiograph 300–400 an

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hour; our experts consider, I believe, 150–200 an hour sufficient for accurate work.

GERMAN ORGANISATION AND STAFFING

It was the policy to provide in war prisoners' hospitals a skeleton administrative staff only, with usually only one German medical officer acting as medical superintendent. Thus, all medical and surgical work and nursing was done by the prisoners themselves. Only very rarely were prisoners-of-war treated in German civilian or military hospitals; those who were so treated generally speak well of the care, attention, and food.

BRITISH STAFF AND ORDERLIES

It may be considered that I have overemphasised the work done in Elsterhorst and elsewhere by individuals. The facts are that these British medical officers were pitchforked into these places, and none could claim much special knowledge of pulmonary tuberculosis. It was the same with the orderlies. But they all got down to it, and, by reading what they could find (pitiably little at first) and by learning from German and French doctors, they built up a team whose results are highly creditable. This efficient team was built up largely in spite of, and rarely with the real assistance and coöperation of, German officialdom (see table VI).

TRANSPORT

German arrangements for the transport of tuberculous prisoners-of-war, and indeed for all sick prisoners, were casual and haphazard in the extreme. It was common for patients with cavities to spend days in trains, usually standing, and most having several changes, during which they carried their own baggage. In spite of our insistence that these were lying cases, only a 50% improvement was achieved, and, to the last, the 6 kilometres between Elsterhorst station and the hospital was often completed on foot.

RED CROSS

Side by side with the work of the British team of medical officers and orderlies went the invaluable contributions of the Red Cross. I am convinced that the food parcels sent by them are directly responsible for the survival of at least half of all the prisoners, let alone those suffering from tuberculosis. The invalid-comforts section, with its extras, its occupational-therapy parcels, and its instruments and drugs, contributed much, enabling patients to live who would otherwise have died. No tribute can be too effusive, for all prisoners-of-war owe much, and many their very lives, to its magnificent work.

REPATRIATED PATIENTS

Our patients after repatriation had a pleasant habit of writing to their old medical officers, giving news of the trip, conditions at home, and so on, and by the end of 1944, after 3 repatriations, many such letters had come to hand. Of these, some 20 or 30 were particularly distressing to us. The facts about these 20–30 patients are as follows:

(1) On departure all were sputum-positive, all had raised or high blood-sedimentation rates, all had cavities barely controlled by artificial pneumothorax.

(2) Some stated in their letters that on arrival in England they had been sent to their homes after a few days, without radiography or any other check. Some stated that they had been discharged forthwith, sent to civilian hospitals or civilian doctors, and then sent home for longer or shorter periods. Some reported hæmoptyses during the first few days at home.

The opinion was freely expressed at Elsterhorst that something seemed to be wrong with the control of pulmonary tuberculosis in England, and I was often asked if it was worth while continuing treatment at Elsterhorst.

This report obviously could not have been compiled without much assistance. Grateful acknowledgment is therefore made to Lieut.-Colonel L. E. Le Souef, Lieutenant Ian Macfarlane, Padre Fraser, and many unnamed comrades in distress. Acknowledgment is made also to the Army Medical Services of the Empire, who made available the official numbers of prisoners-of-war, &c., from their respective countries.

Health Centres of Today

VII. SWINDON

JOHN LOWE
M.D. Edin., F.R.C.S.E.
SUPERINTENDENT MEDICAL OFFICER

WILLIAM J. LEWIS
F.C.C.S.
SECRETARY
GREAT WESTERN RAILWAY MEDICAL FUND SOCIETY

WHEN the Great Western Railway Company decided to build its locomotive works at Swindon large numbers of craftsmen were transferred from various parts of the country. At that time Swindon was a small market town, and it was necessary not only to build houses for the workers and their families but also to provide a medical service, since there were not enough doctors in the town to meet the needs of this large influx. Thus the Medical Fund Society came into being almost a hundred years ago, in 1847. Membership was compulsory for all employees until 1911, when the National Health Insurance Bill was passed; since then membership has not been compulsory, but it is still restricted to employees of the company or their dependants. Registered as a friendly society, it later became an approved institution and was allowed to contract for panel members; in 1937 the total membership, including dependants, was 43,000, of whom 16,000 were panel members. (The population of Swindon was then about 63,000.) These figures are a remarkable tribute to the efficiency of the society, which many residents in the town would join if they were not debarred by the rules. The benefits which it offers and which are not provided under the National Health Insurance Act are (1) a medical service not only for workers but also for their wives and families; (2) a consultant service; and (3) hospital treatment.

BUILDINGS

The society has three buildings, all close to each other, which together could be regarded as a health centre.

1. *Dispensary and baths.*—These are contained in a brick building measuring 160 ft. by 219 ft., which occupies a convenient central position on two main thoroughfares through which pass the town's main bus-routes. The ground floor accommodates consulting-rooms, waiting-rooms, dispensary, general office, physiotherapy department, washing-baths, Turkish and Russian baths, and two excellent swimming-baths in which the water is heated, chlorinated, and continuously flowing. The swimming-baths are used by the local education committees.

The first floor houses the ophthalmic department, three dental surgeries with anæsthetic and recovery rooms, three dental workshops where dentures are made and repaired, the chiropody department, a laundry, and a committee-room.

2. *Surgical outpatient department.*—This is a stone building with a good-sized waiting-room, examination-rooms, and a small operating-theatre where minor surgical conditions are treated under the supervision of a consultant surgeon. This department is very busy from 9 A.M. to 12 NOON, when a large number of patients attend for consultations and dressings; in 1943 outpatient consultations numbered over 30,000.

3. *The hospital.*—This is a small permanent building, with an extension which was added to increase the accommodation. It is the first-aid dressing-station for the G.W.R. factory and has 42 beds where members are admitted for operation. The policy is to transfer this work to the near-by county-council hospital, and to use the space thus liberated for a rehabilitation centre. In 1943, 778 patients were admitted and 459 major operations were performed.

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PROFESSIONAL STAFF

Assistant medical officers.—The medical staff includes 8 full-time assistant medical officers whose duties are those of general practitioners. Each is provided with a surgery at which he attends from 9.30 to 10.30 A.M. Members attending the centre have free choice of doctors. The medical officer writes his prescription in the membership book, which the patient takes to the dispensary. After surgery hours each doctor carries out domiciliary visits in a district allocated to him; visits are limited to a radius of 4 miles from the centre. After his round is finished, the doctor is free, but on alternate nights he has to attend surgery from 5.30 to 7.30 P.M. Once a week he is on duty for urgent calls for a period of 24 hours; a car and chauffeur are provided; and he is excused attendance at surgery the following morning. In case the medical officer on this rotation duty is unable to see the doctors who subsequently attend patients urgently visited, reports of such calls are recorded in a special book; a carbon copy is made and the detachable upper leaf is given to the district doctor, who is then aware of the diagnosis and treatment of his colleague. This arrangement has proved very helpful, and has been welcomed by all medical officers.

It is the society's rule that if a patient desires a second opinion, he shall ask the attending doctor to arrange it. This was introduced to meet the case of the patient who might not have full confidence in the doctor appointed to his district, but experience has shown that requests for second opinions are instituted almost always by the doctors themselves; the opinion is usually provided by the appropriate consultant.

Two additional medical officers assist the surgeon in the work of the outpatient department and hospital.

Assistant medical officers are allowed to retain extra fees, such as those for insurance reports, postmortems, notification of infectious diseases, and attendance at a coroner's court, provided that the charge is not borne by a member. The staff has ample off-duty time for study or recreation, and each assistant medical officer is allowed three weeks' holiday a year with full pay.

Consultants in surgery and ophthalmology attend daily, and visiting consultants in diseases of the ear, nose, and throat, gynæcology and obstetrics, pathology, radiology, and general medicine attend at specified times, usually once a week. These consultant services are provided in collaboration with the Wiltshire County Council.

Dental surgeons.—Three full-time dental surgeons are employed, and the head of the department holds also a medical qualification.

Medical auxiliaries.—A large number of medical auxiliaries are employed in the various departments. There are three full-time physiotherapists and a dispensary staff of eight headed by a pharmacist. The ophthalmic department has a fully qualified dispensing optician and a receptionist; and the dental department employs three dental nurses, a receptionist, and six dental mechanics. There are two full-time chiropodists, who are kept extremely busy. A technician in pathology attends at least once a week, and representatives of two firms of instrument-makers attend weekly and work under the direction of the surgeon. A radiographer does the X-ray work.

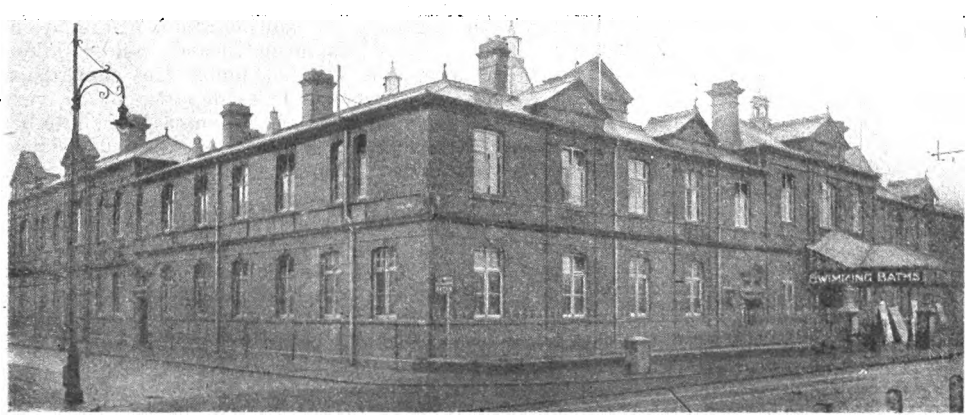
SPECIAL SERVICES

Clinics.—A new departure of considerable importance was made some years ago when assistant medical officers were first encouraged to specialise in a small branch of medicine, with extra remuneration for this work. The status of assistant medical officer was thereby enhanced, and an improved service provided for members. Special clinics staffed in this way include those for skin diseases, psychological medicine, child health, midwifery (including antenatal and postnatal in conjunction with the local authority), physical medicine, and allergy.

Liaison with other organisations.—Particular stress must be laid on the happy relations between the society and Wiltshire County Council. The two have recently coöperated closely in the provision of hospital services and the attraction of consultants to the neighbourhood; most of the hospital work is now carried out at St. Margaret's Hospital, which is a county-council institution, and it is hoped that soon all hospital work will be done there. Consultants attend St. Margaret's Hospital in the morning and the centre in the afternoon, when they see outpatients referred to them by the society's medical officers. When hospital treatment is needed, outpatients are admitted to St. Margaret's under the care of the consultant; this arrangement has proved most satisfactory, and results in the closest liaison between the staffs of hospital and health centre. If special treatment which cannot be provided in Swindon is needed patients are transferred to London or other areas; as the railway company allows free travel and the society pays any other charge, this does not usually involve additional expenditure by the member.

Rehabilitation.—A scheme which has been formulated for Swindon shows the important part that health centres could play in the rehabilitation of injured or ill workmen. In 1943 interested organisations were represented at a conference at which it was agreed that a rehabilitation centre for outpatients should be established on the society's premises, making use of its physiotherapy department and staff; the long-term cases were to be retained at St. Margaret's Hospital (a fracture A clinic), which would have its own rehabilitation centre for inpatients and convalescents. An orthopædic surgeon was to take charge of inpatients at St. Margaret's, and would attend daily at the outpatients' department of the centre, to deal with the various types of traumatic surgery. Games and physical exercises, and the physiotherapy and occupational therapy departments were also to come under his supervision.

This plan was approved by all concerned, but it was not then possible to put it into operation as both the society's and St. Margaret's hospitals were detailed for reception of patients evacuated by



Dispensary and baths

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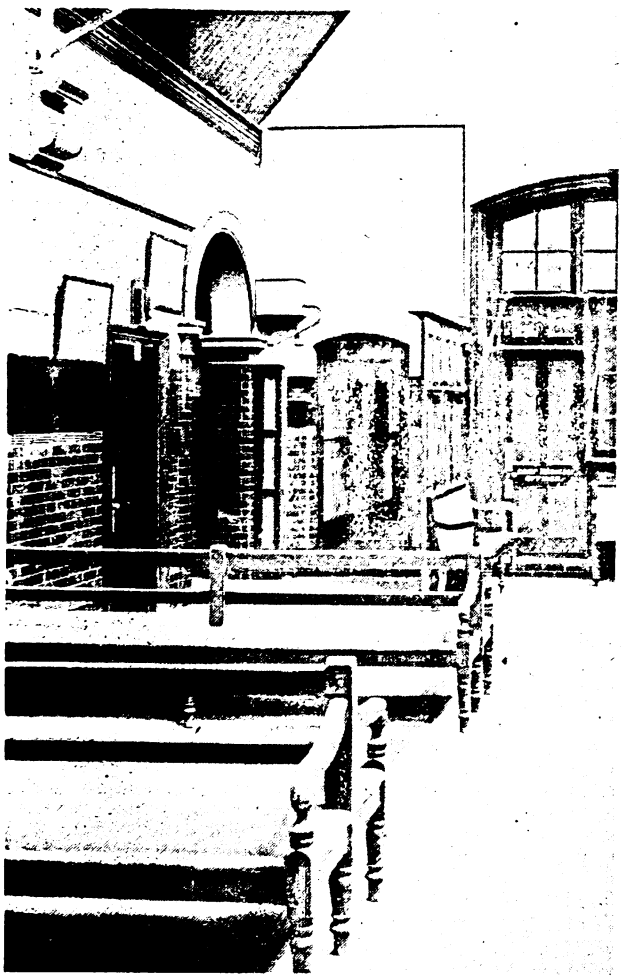

Dispensary waiting-hall

air from the Continent after D-day. It will now be acted on as soon as possible.

Maintenance of health.—It must not be thought that the society caters only for disease; its object is to promote health, and it was with this aim that the various baths were provided. The rules provide for lectures in health; and but for the outbreak of war distinguished consultants would have been invited to speak on social medicine and the maintenance of health.

From this account it will be seen that the society provides for its members' needs from cradle to grave; in the words of a distinguished medical visitor, "The Medical Fund Society is the only current example in this country of an attempt to provide a comprehensive health service for its beneficiaries."

ADMINISTRATION

The property of the society is vested in five trustees. In addition there are a president, eight vice-presidents, and a management committee elected by ballot, of whom about a half retire every two years. Democratic contro is thus assured. One committee member is appointed for approximately every thousand members, and at present the management committee numbers fifteen. They appoint among themselves four subcommittees to administer the various departments; each subcommittee meets at least once a month and reports its decisions to the management committee.

The superintendent medical officer, in coöperation with the committee, organises and supervises the professional staff; otherwise the secretary is the chief administrative officer; a public auditor is appointed annually at the general meeting of members.

Finance.—When membership of the society was compulsory, the contribution for a married man and his family was 1*d.* a week. The contributions, with a small deduction for management expenses, were paid to the superintendent medical officer, who appointed and paid his assistants and purchased all drugs. When the society became an approved institution it received the capitation and dispensing fees for all its panel members, who pay 2*d.* a week less than non-panel members. Since 1920 the medical staff has held contracts of service with the society, which pays all salaries direct to each member of the staff. A contributory superannuation scheme is provided for all full-time employees of the society and for two of the part-time consultants.

Present contributions vary from 10*d.* a week by a married man not on the society's panel, to include his wife and all dependent children, to ½*d.* a week by retired members who are on the society's panel. Contributions are collected from salaries by the railway company, except in the case of retired and widow members. Income from this source amounts to about £25,000 per annum, and from capitation fees, £10,000 per annum. The company makes an annual donation of £1750, which includes payment for the use of the hospital as the first-aid dressing-station. Members' contributions entitle them to domiciliary medical and consultant services, including the provision of drugs, to free hospital treatment, and to the loan of sickroom appliances and invalid chairs. Dental and ophthalmic appliances are supplied at charges somewhat lower than those agreed by the Dental Benefit Council and the Ophthalmic Benefit Approved Committee; and grants are collected from approved societies. A charge of 1*s.* per treatment (6*d.* for retired and widow members) is made in the physical medicine and chiropody departments; and members are admitted to the various baths at cheaper rates than non-members. Artificial limbs, trusses, and other appliances are supplied on payment by the member of half the cost, the society paying the other half. Aids to hearing are supplied on special terms. The society bears half the cost of treatment in convalescent homes to which it subscribes. The title to all benefits is the membership book, which must be produced on all occasions.

Records.—These include separate records of youths attaining the ages of 16 and 21, in order to compute contributions. Other than these, the National Health Insurance medical envelopes are the only records. These are posted in the secretary's office, and for each insured person seen by him the doctor prepares a special slip which is passed to the office and placed in the medical record envelope. A centre such as this provides an admirable opportunity for preparing health and sickness records, but circumstances have hitherto prevented the introduction of a statistical section.

EXHIBITIONS can help to arouse and maintain the interest of the general public in health education. With this as their aim the Cardiff public-health committee have planned a Health and Housing Exhibition to be held in the city hall from June 17 to 22. There will be ten bays in the large assembly room, representing health through the home, school, recreation, nutrition, personal hygiene, housing, community, careers, port, and knowledge. In two adjoining rooms will be exhibits of hospital services for mental and bodily health. All interested in the possibilities of health education are invited to visit the exhibition at Cardiff, and to discuss the subject with the specialists who will be in charge of each bay. The medical officer of health, Dr. J. Greenwood Wilson, is organising the exhibits; and a detailed programme is obtainable from the public relations officer, 52, Park Place, Cardiff.

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In England Now

A Running Commentary by Peripatetic Correspondents

"*Sing a song of sixpence*" thumped on the piano by a rather stout R.A. major. The eager chorus of children's voices—Burmese children, Indian and Chinese children, Karen children, and children of other North Burma tribes. Applause from many tiny hands; then "*The King was in the parlour*" and more English nursery rhymes (strangely enough, the Burmese have no nursery rhymes of their own), and more clapping. And then dances and games, in which the children vividly represent, with gestures, the simple tale which the teacher tells. Later on the children volunteered, in their "composition," that this had been a grand morning because two big friends, in soldier's uniform, had been to the school and had played with them.

This Montessori school in Rangoon was got together with loving patience, and with no Government support (nay, with the hostility of the bureaucracy), by the charming and cultured Ma Mya Kyi, the aristocrat-born wife of a communist (in Burma a married woman retains her personal and family name—so high is the status and dignity of womanhood in this country). It was not easy to get the school into working order, after the shambles of Japanese occupation; and during the dark years of war the children had been running wild, the pre-war inadequate schools had been destroyed, and prices for the most simple pieces of equipment were fantastic. Still, loving and patriotic hands just had to do something for the children. And here they were now, 130 of them, girls and boys together, coming from all classes and all nationalities in Rangoon, nursery children and children of school age up to 12 years old, happy, self-confident children, perfectly disciplined in their freedom from bashfulness, learning through song, dance, and lesson to become good citizens of the new nation which is being born.

Ma Mya Kyi was happy in her school, but she told us of the hundreds of thousands of children in Burma yet with no schools; and I remembered a rather pompously worded Government report on education, fixing the goal for universal free compulsory elementary education at 40 years from now. Who can blame Ma Mya Kyi and other Burmese patriots if they say that this won't do? Who can blame them for being bitter? Yet they are friendly and generous in their hospitality towards us strangers in uniform, only acquainted through a conversation started at a meeting of the Rangoon East and West Club. These clubs are doing invaluable work out here and throughout the Far East, and no British Service man need leave these lands without having met many interesting people and learnt to know and respect them.

* * *

I have prided myself on my nicely balanced outlook ever since I discovered, back in 1916, that my eyes see colours differently. During a very boring lecture on pharmacology I was idly amusing myself by covering first one eye and then the other, and found that the khaki uniform in front of me looked greenish to my right eye and reddish-brown to my left. This was not merely a transient effect due to after-image—it is still present after thirty years. It is best observed by looking with alternate eyes (it does not matter which eye first) at rather neutral tints, something with a blend of red and green; but even a pure green, if not too vivid, appears brighter to the right eye; reds, on the other hand, look brighter to the left eye. I am by no means colour-blind—in fact, my perception of colours and ability to match different shades is, I fancy, remarkably keen, and I passed the special colour-tests in the R.A.F. in 1942. Or perhaps I am colour-blind in both eyes but in opposite ways, the final result being that two wrongs make a very good right.

* * *

It was one of those beautiful crisp spring mornings which are scattered indiscriminately throughout the year in this country, and being Sunday it was ideal for a brisk walk or a round of golf; but coming as it did at the end of forty-eight hours during which we had successively handled an eclampsia, a retained placenta, two post-partum hæmorrhages requiring transfusion, and an antepartum hæmorrhage, our intention was a morning in bed. We found ourselves carrying out cæsarean section for another antepartum hæmorrhage due to placenta prævia. For some reason—oh yes, the patient was in strong labour—we had forsaken our usual local analgesia and the anæsthetist had wandered off towards the end of the operation in the way that anæsthetists do. The dressing had just been applied when he returned bearing the *Gospel Gems* calendar with which the unit is equipped. "If you'd read your calendar you'd save yourself a lot of trouble" he said, handing it over. The "gem" for that day was "Our God . . . is able to deliver"—Daniel, III, 17. Sister, after a quick glance at the gem (cut apparently to meet the occasion, though not by us), handed back the calendar with "Yes doctor, but He often uses instruments." The anæsthetist was Irish and the sister Welsh; the surgeon was English, which may account for his failure to think of anything in time; or possibly it was because he had been the common factor in the previous forty-eight hours' obstetrical exercise.

* * *

When I was about 7 years old I was taken by my mother to call on a great-aunt, who was old and thin. I gazed in astonishment at two strings of skin which hung down from her chin to her collar. When we left I asked my mother what they were. She said they were a sign of old age, and were very ugly, adding that she hoped she would never have them. Alas she did, as she lived to the age of 91, and was very thin. Since then I have idly wondered what the explanation of the strings in the neck is. Last June, I accidentally picked up a fold of skin on the back of my hand and after a few moments let it go. To my astonishment the fold remained unaltered until I moved my fingers. I then tried my H.P.'s hand, but as soon as I let the fold go the skin flattened out at once, showing that his skin was elastic, whereas mine was so no longer. Last September, while dressing for dinner in the light of the setting sun, on a day in which I had walked over 20 miles on the moor, I noticed two strings of skin hanging down from my chin. I then recognised the cause of the condition which I had first seen 56 years ago. My skin has lost so much elasticity that it can no longer keep itself braced back, but obeys the law of gravity. This also explains why the fat cheeks and double chin of the aged shake like a jelly; the soft finger-tips, which are so easily indented and yield blood unwillingly, are due to the same cause.

I hope my brain is not as inelastic as my skin, or so fossilised as my jaw.

* * *

Reflect, yea Genuflect
Before the Leucotome.
There should be one in every home!
Incision ends decision.
A paper-knife in his frontal lobe
Would have saved much strife
In the life of Job;
And relieved that ache
For the Good, in Blake.

* * *

The English language presents many pitfalls to the unsuspecting foreigner. I have just received the programme of a scientific congress in Belgium which includes "lectures for scientific vulgarisation followed by film projections and practical demonstrations." Some ex-R.A.M.C. officers may remember a course at Mytchett which lived up to this description.

Then an Austrian doctor, desirous of employment in the British Empire, concludes his letter by saying that he is "in every way irreproachable." One cannot help feeling that such a paragon could hardly be spared from the work of rehabilitating his own unhappy country, especially as he made no attempt to leave it during the period of Nazi supremacy.

* * *

Yes; we know that occupational disease described by another peripatetic as "Medical Officer's Demob Aphasia" in the R.N.V.R. Our best clinical example of this occurred at the end of a day's demob medicals. The S.M.O. was listening intently to the excited chest of one prospective civilian when, instead of the usual "Take a deep breath," I was surprised to hear him say, "Sick Bay, S.M.O. speaking."

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Letters to the Editor

THE G.M.C.

SIR,—In an article on the future of medical education (*Lancet*, 1940, i, 420) I drew attention to the two very disparate functions (educational and penal) of the General Medical Council. I pointed out that the constitution of this body was not designed adequately to fulfil either function, and more especially the judicial function. The council have now been forced to consider "proposals for the reform of the Medical Acts of which they are the instrument." This is of course all to the good; but when one remembers the many years during which they have exercised their functions with apparently self-satisfied equanimity it is to be hoped that some higher tribunal may be appointed by the Government not only to consider their recommendations but thoroughly to investigate both the educational and the judicial aspects of the problem. If the matter were not so serious one might suggest that Sir Alan Herbert be a member of the tribunal, and that it might issue a decree dissolving the unholy matrimony of two such incompatible bedfellows—? on grounds of unprofessional conduct.

Leeds. J. HERBERT PARSONS.

SIR,—The case of Dr. Hennessy opens up the whole question of the disciplinary powers of the G.M.C. The whole procedure demands reform. The Medical Act is nearly a century old and its repeal is urgently required. There are those who desire that the tribunal should remain a domestic one of a strictly professional nature, but I am not sure that this would help to solve the problem. Cases are tried before a body of medical men none of whom possess much, if any, knowledge of the law of procedure and evidence. Until the Act of 1858 is repealed would it not be a wise measure if, in the approaching election to the council, preference were given to those possessing a university degree in law or to barristers-at-law? I am strongly of opinion that such persons, if elected, would help to promote a definite improvement in the hearing of cases brought before this tribunal. It cannot be said that medical men who have no legal qualification are fully qualified to assess the evidence brought before them. The "legal mind" is definitely a great asset in all such cases. It is, I fear, sadly lacking in the council as at present constituted.

Edinburgh. JAMES BURNET.

WHITHER MEDICINE?

SIR,—Dr. Grieve's plea for more philosophy in medicine is strongly supported by Dr. Roe's letter. In ordinary language the word philosophical (when used in contrast with the word scientific) means "comprehensive and unified" (in contrast with "narrow and abstracted"). Dr. Roe confuses both himself and the point at issue by using the word "science" as equivalent with the word "philosophy." No-one can stop him doing this; but it does not make for clarity. Secondly, Dr. Roe seems to suppose that Hegel introduced the dialectic "idea"—whatever that may be. Socrates or Plato introduced dialectic as a *method* of discovering truth. Again we read "Karl Marx applied this *principle*" (presumably meaning the dialectical method) "to the *material* world, and *thus* brought the *whole* of philosophy into the realm of natural philosophy" (italics mine). The conclusion of Dr. Roe's sentence does not follow from its premise, unless we are prepared to admit that the "material world" comprehends the whole of experience (i.e., of "livingness," as Dr. Roe calls it). Only if we admit that the material is the whole can *scientia* equate with *philosophia*—and that is just what the argument is about! Dr. Roe admits that "science cannot immediately or even in the future tell us what the soul is." Are we to conclude from this that we must therefore cease, as doctors, to try to deal with disorders of the soul until Dr. Roe and his scientific colleagues have settled amongst themselves whether the soul is "significant" or whether it exists?

I suggest that the philosophical doctor views the sick under at least four "sets of abstractions"—namely, the physical or material, the personal or psychological, the social, and the spiritual. By the spiritual I mean that he views people as beings who desire, who have aims, values, and purposes that are "significant—at least to themselves." Having studied his patient in these ways, the philosophical doctor endeavours to unify these four views, to make a diagnosis, and to institute treatment, on as many of these "levels of experience" as may seem to be necessary.

The real trouble is not that we have too much science but that we have not enough philosophy both as individual doctors and (it seems) in our medical schools.

Worcester. HOWARD E. COLLIER.

EMERGENCY PATHOLOGY SERVICE

SIR,—I have read with interest Dr. Robb-Smith's article of April 6 on the Future of Clinical Pathology, with which, in general, I agree; but I do take exception to the niggardly tribute he pays to the pathology service of the Ministry of Health's Emergency Medical Service. This obviously arises from lack of knowledge of its origin, organisation, and achievements.

In 1938, at the instigation of the Medical Research Council, a group of pathologists, drawn principally from the London teaching hospitals, met to consider the requirements of hospital pathology in the E.M.S. of the London region. The scheme which these pathologists devised was based on the sectors of the London region and aimed at providing a pathological service for London and the Home Counties with a standard of work equivalent to that of the university teaching hospitals. In each of the sectors a central laboratory was to be set up under the supervision of a senior pathologist of university status—the sector pathologist—and on him devolved the supervision of the subsidiary laboratories of his sector and the coördination of the sector service. At the same time, a register was made of pathologists and laboratory technicians throughout the country. The register was maintained by the M.R.C. for the Ministry of Labour, and it was through this register that pathologists and laboratory technicians were allocated to Service and civilian posts during the war.

The scheme for the E.M.S. pathology service in the London region was completed and accepted by the Ministry of Health early in 1939, and within 24 hours of the outbreak of war much of it was already functioning. Coördination of the laboratory services of the London sectors was maintained by the formation of a Sector Pathologists Committee meeting at frequent and regular intervals. Early in the war it was realised that someone with a wide experience of diagnostic pathological work was required at the centre in the Ministry of Health, to act as adviser on pathological matters and to interpret the wishes of pathologists to the Ministry. Dr. Panton undertook this onerous task and what success the sector service has achieved has been due in no small measure to the way in which he carried out these duties. The Sector Pathologists Committee, which now includes representatives of the L.C.C., the M.C.C., the K.C.C., and the Emergency Public Health Laboratory Service, met the adviser of the Ministry of Health once a month throughout the war to discuss the working of the pathological services in Region V (London and Home Counties) and to advise on the numerous administrative and scientific points which arose.

The problem of supplying media and laboratory equipment was overcome by establishing a Central Supply under the direction of Major McCartney of the L.C.C., whose administrative skill and extensive knowledge of these matters provided us with an admirable service which later was made available to the other regions of the E.M.S. and to the Army Pathology Service.

Soon after his appointment to the Ministry of Health, Dr. Panton started organising a similar service in the other regions of England and Wales. Here the task was a much greater one than in the London region. Some parts of the country had good pathology services, but in many they simply did not exist; and it is entirely due to his foresight, energy, and tact that a coördinated hospital laboratory service is now working throughout the country.

Apart from routine diagnostic pathology and public-health work which was carried out by the Emergency Pathology Service, many pathologists and technicians have been trained in the larger and central laboratories under the Ministry of Health's trainee scheme, which has maintained a supply of pathologists for both the fighting and civilian services, and but for the energetic

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perseverance of Dr. Panton this supply would not have been forthcoming. Courses in special bacteriology were given to Army pathologists and in penicillin therapy to the hospital medical and laboratory staffs throughout the country. In the sector laboratories much individual research was done and many special and urgent problems, such as hospital infection and the anaerobic infection of wounds, were tackled and the findings incorporated in official reports from the Medical Research Council.

Thus an efficient and modern laboratory service, such as this country had never previously enjoyed, was established, a service capable of diagnostic and research work of a high order and of directing and applying the usage of the very latest discoveries. This service was available to every hospital, medical officer of health, and general practitioner throughout the country, and I consider that, together with the Emergency Public Health Laboratory Service of the Medical Research Council, it has largely contributed to the good health of the country in war-time and to the lowering of the death-rate.

To suggest, as Dr. Robb-Smith does, that all this was achieved as the result of the good will of pathologists is frankly absurd. Good will was, of course, an essential ingredient of success, but without planning and coördination at the centre it would have achieved very little. This service has been tried, and maintained at a high level of efficiency, throughout very difficult times; and if, as is to be hoped, it is to form the basis for any new National Laboratory Service, we need have no fear for the future of hospital pathology in this country.

JAMES MCINTOSH
Sector v E.M.S. Chairman of the London Sector Pathologists Committee.
Stoke Mandeville Hospital, Bucks.

PROFESSOR STOCKMAN, FIBROSITIS, AND RHEUMATISM

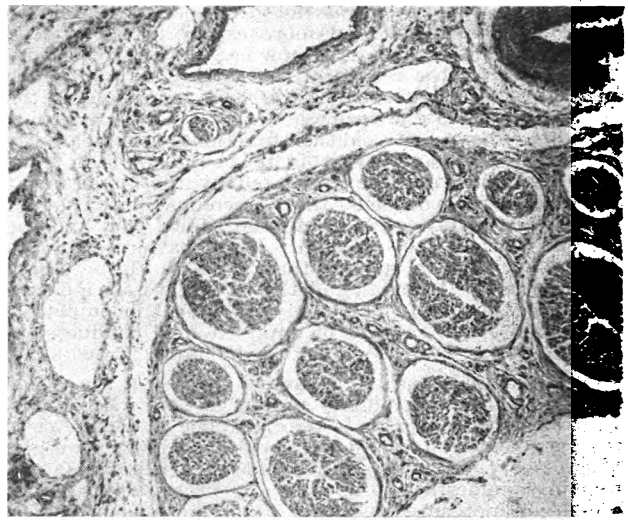
SIR,—Your obituary notice of Prof. Ralph Stockman on March 30 refers to his long and painstaking investigation of rheumatism that was embodied in his classical book *Rheumatism and Arthritis*, published in 1920. May I amplify this from a personal experience?

Stockman's great achievement was his demonstration of the histological features of the lesions present in man during fibrositis, and his proof that the process consists of an actual inflammation of the fibrous tissue itself. In this way he was the first to place the pathology of fibrositis on a firm basis, and it may be that some day this will be recognised by calling fibrositis Stockman's disease.

My acquaintance with him came about in the following way. In 1938 a discussion on rheumatism was to take place in the autumn. With the hope of obtaining some light on the genesis of the characteristic lesions of acute rheumatism, the pathogenic action of various viruses for the rabbit was compared experimentally, and the most promising of them—the M4 strain of Tulloch, an example of variola-lapine isolated from smallpox crusts by Sobernheim via the rabbit—was selected because of its activity. The virulence of this strain was then raised to the highest pitch by passage, and repeated doses of it given by vein in order to see if it could give rise to endocarditis. No definite endocarditis was observed, but periarticular swellings were produced that occurred most frequently in the tissues surrounding the tendo Achillis. Histologically, to my surprise, the lesion consisted of an acute inflammation of the fibrous tissue itself with a serofibrinous exudate that contained lymphocytes together with the virus in pure culture and large amount. Professor Stockman very kindly consented to see the sections, and he agreed that these rabbit lesions were similar to those present in human cases of fibrositis. In some further experiments evidence was obtained that by mixing this M4 virus with the hæmolytic streptococcus, the pathogenicity of the latter was increased, and occasionally seemed to be able to suppress the streptococcus altogether in the rabbit's tissues.

These observations were described during a discussion on rheumatism at the annual meeting of the British Medical Association at Plymouth in 1938, and published in *The Rheumatic Diseases*, the official journal of the Empire Rheumatism Council, of January, 1939.

In giving his opinion on the sections, Professor Stockman was careful to point out that other factors beside the virus can give rise to fibrositis. Possibly, among other factors, he may have had in mind the gonococcus, but when intravenous injection of the streptococcus was pushed in the same way in the rabbit, the arthritic effect



Section of nerve trunk (R.34) illustrating the "fibrositic" action of M4 virus.

was not limited to the periphery of the joint as in the case of the virus, but seemed to be more severe, and exceptionally to lead to the generation of pus. The virus lesions, on the other hand, never suppurated, and after an interval cleared up. These experiments afford some ground for harmonising the rival contentions that the arthritis of acute rheumatism is due to a virus or to a streptococcus alone, and suggest that both may play a part. Furthermore, it seems possible that material from a suitable case at an early stage of acute rheumatism may, by rabbit passage in the manner employed by Sobernheim for smallpox crusts, provide evidence of the presence of a virus that when its virulence for the rabbit has been raised to the highest pitch will reproduce the heart lesions of acute rheumatism. For success it seems essential to secure the fullest virulence, as the M4 virus in question at one stage lost its power to produce fibrositis and only regained it when potency had been restored by further passage.

The specialised action of this M4 virus on fibrous tissue is illustrated by the accompanying section of a nerve trunk near the tendo Achillis of a rabbit six days after the virus had been injected into an ear vein. The inflammatory change has not only affected the perineural fibrous tissue: in this "incident" it has also involved the fibrous stroma of the nerve trunk itself.

M. H. GORDON.

THE DUODENAL ULCER CONSTITUTION

SIR,—Mr. Ralph Thompson's observations on the "constitution" associated with duodenal ulcer (April 13) provide interesting support for the anatomical representations of his eminent predecessors. Some 30 years ago David Wilkie explained the preponderance of this lesion in the male as dependent on his relatively high pylorus and short fixed duodenum subjecting the hepatoduodenal ligament to strain, which, in the female with her relatively low pylorus and lax duodenum, is borne by the gastrohepatic omentum and lesser curvature. The fixity of the male duodenum, on which Mr. Thompson insists, Wilkie regarded as predisposing to kinking at the first duodenal angle and, as a consequence, to an unduly long exposure of its first part to acid chyme undiluted by bile or pancreatic juices, regurgitation of which is impeded.

Arbuthnot Lane was even more dogmatically in favour of the mechanical hypothesis. The greater rigidity of the male abdominal wall with corresponding cramping of the

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viscera led, in his opinion, to kinking at the duodeno-jejunal flexure with consequent distension of the duodenum and ultimately ulceration. Lane was even prepared to believe the lesser tendency in women to angulation at this junction as paramount in immunity, notwithstanding the greater frequency of intestinal stasis in the female which he regarded as predisposing to ulcer (as to many other conditions!).

At the end of the first great war, when I sat with Lane on medical boards, the coincidence of three instances in one afternoon of young officers with duodenal ulcer inspired him to deliver an extempore lecture on these lines. All three were athletes—two runners, one an oarsman. Lane insisted that contraction of powerful abdominal muscles thrust the abdominal organs down into the pelvis, causing the development of supporting bands—a favourite conception of Lane's—much as colonic distension caused their development in the subjects of chronic intestinal stasis. Sagging of a full and heavy ileum resulted in pulling upon the duodeno-jejunal flexure, the next fixed point. In this way the duodenum became distended and yielded in its first (relatively mobile) part with a tendency to give way on its convex surface.

Many—physicians in particular—were unconvinced that kinking of the duodenum played any part in the ætiology of ulcer. The days of neurogenic responsibility had not yet arrived, but even then I ventured to question if the highly strung emotional temperament so familiar in athletes might not be the really important factor rather than the physical accompaniments of violent exercise, a point of view with which the great surgeon had little sympathy.

Time has brought into prominence the responsibility of the nervous system in the genesis of peptic ulcer on physical and psychical grounds; but it is well that a modern observer should provide, as Mr. Thompson has done, a salutary reminder that there is still room for anatomical considerations while indirectly paying a tribute to the memory of the giants of the past.

London, W.1. ADOLPHE ABRAHAMS.

BLOOD-TRANSFUSION IN MAXILLOFACIAL INJURY

SIR,—Mr. Patrick Clarkson and Dr. R. S. Murley raise interesting points in reply to my letter of April 13.

Mr. Clarkson rightly stresses the danger of bleeding into the nasopharynx; but I was writing purely of loss of blood per se. It was perhaps not made sufficiently clear that the injuries I saw were sustained in the Burma campaign, with its peculiar difficulties. At the beginning of 1945 I examined all maxillofacial cases from the Burma front when they were at Calcutta in transit to the main base units. Their numbers were great, and medical officers were not always at hand. It was plainly necessary to anticipate the emergency of secondary hæmorrhage, and the routine described in my letter was introduced after the death of an Indian soldier within a few minutes through this cause. He had just been admitted from the evacuation plane, and was very dehydrated. He had a copious hæmorrhage, which ceased spontaneously after the loss of about 2 pints, probably owing to the fall in blood-pressure. Local pressure was applied in the mouth, but before the drip, which was speedily connected, was working, the man had died. This patient might, of course, have died in any case, but the occasion provided the stimulus for the subsequent precautions.

The following points should be made clear. (1) Only about 5% of jaw cases received drips of any kind after being wounded about 3 days previously; most drips were discontinued after 24–48 hours. (2) Secondary hæmorrhage is exceedingly rare in civilian jaw fractures, and my comments relate only to war injuries sustained in Burma. (3) Many patients were 24 hours in the jungle before receiving medical attention; they then had to wait for a plane to a hospital, whence, after a further 24 hours, they were flown to Calcutta; and they had an ambulance journey of 18 hours before admission under my care. Often they had to wait 4–5 days before getting some jaw stabilisation, and would not swallow fluids owing to pain, fear, and inanition. Skilled nursing attention en route was never available.

Dr. Murley, in his criticism of the prolonged glucose-saline transfusion, does not, I think, take full account of these conditions. Given similar circumstances, I feel that I should again adopt the same measures.

Oxford. D. S. HAYTON-WILLIAMS.

Public Health

Northern Ireland Tuberculosis Act

A NEW Public Health (Tuberculosis) Act was passed by the Parliament of Northern Ireland on Feb. 28. Under it, a tuberculosis authority was set up which met for the first time on April 8 and is already a going concern. Of its members 4 are nominated by the Belfast county-borough council, 2 by each of the county councils of Antrim and Down, 1 by the Londonderry county-borough council, 1 by each of the county councils of Armagh, Fermanagh, Londonderry, and Tyrone, and 4 by the minister of health. The authority has the right to coöpt one or two additional members. At present its only medical member is Dr. W. J. Wilson, professor of public health and hygiene in the Queen's University, Belfast.

Its chief duties are to provide accommodation for people suffering from tuberculosis, including their general care and maintenance during treatment, and their care and reablement after treatment; to discover fresh cases, and prevent spread of the disease; to educate patients and public in treatment and prevention; and to improve medical and nursing training in tuberculosis.

Notification of tuberculosis in any form has become compulsory; and when a doctor sends in a prescribed form stating that a patient has a primary complex or any significant tuberculous condition, the authority will arrange for the patient to be "medically examined for the purpose of diagnosis" without charge. The authority has powers to require any contact to submit himself for examination by an approved medical officer. Where an infectious person cannot be safely segregated in his own home the authority will be able to apply for a court order to have him removed to hospital and detained there for not more than three months—a period which can be extended by the court to six months if the authority shows that the conditions which led to his detention would be reproduced if he returned home. Where such an order has been made the authority will, if directed by the court, pay all or part of the cost of removal to hospital and his care there, and contribute to the maintenance of his dependants.

The authority has powers to acquire, improve, equip, and maintain buildings, to provide medical, nursing, dental, and other treatment, to provide laboratories for research into the disease, and to develop a health centre or colony. Capital expenditure of the new authority will be borne by the Government, maintenance costs being shared by the Government and local authorities.

Infectious Disease in England and Wales

WEEK ENDED APRIL 20

Notifications.—Infectious disease: smallpox, 3 imported cases (1 at Camberwell, 1 at Ilford, 1 at Manchester); scarlet fever, 1051; whooping-cough, 1607; diphtheria, 415; paratyphoid, 9; typhoid, 3; measles (excluding rubella), 2392; pneumonia (primary or influenzal), 652; cerebrospinal fever, 64; poliomyelitis, 5; polio-encephalitis, 0; encephalitis lethargica, 1; dysentery, 189; puerperal pyrexia, 107; ophthalmia neonatorum, 60. No case of cholera or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 1 (1) from measles, 8 (0) from whooping-cough, 5 (1) from diphtheria, 45 (6) from diarrhœa and enteritis under two years, and 28 (4) from influenza.

The number of stillbirths notified during the week was 247 (corresponding to a rate of 33 per thousand total births), including 30 in London.

Surgeon Rear-Admirals A. E. Malone and J. A. O'Flynn have been appointed honorary physicians to the King, Surgeon Rear-Admiral H. M. Whelan an honorary surgeon.

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Obituary

HAROLD JALLAND STILES

K.B.E., M.B. EDIN., F.R.C.S.E., F.R.S.E.

Sir Harold Stiles died on April 20 at the age of 83, in his home at Gullane, East Lothian. Twenty-one years have elapsed since he retired from practice, and with the world moving as it does we may have become a little forgetful of the prominent part which he played in various fields of Surgery's art and science.

He was born at Spalding, Lincolnshire, in March, 1863. Through two generations a Stiles had conducted general practice in the district, and it was accepted that Harold and his brother would follow the family tradition.

A. Swan Watson

His brother, several years his senior, entered University College, London, and at the age of 15 Harold was initiated into medicine as an apprentice to his father. From the first he showed a remarkable interest in anatomy, and an aptitude for mastering its detail. A copy of "Heath" was his constant companion; an understanding father had placed a "skeleton" at his disposal; and he gained at this early age a knowledge of the subject which in some measure decided his future career.

In 1881 he began the study of medicine at Edinburgh. His father had chosen this school because of the fame of such giants as Syme and Lister, but it was a happy selection in other ways. Stiles fell in love with the old city as soon as he set foot in it, and, as he says in his *Reminiscences*, he there and then determined to make it his home—an unusual resolution for a first-year student to make, and keep. Graduating in 1885 with first-class honours, he was awarded the Ettles scholarship, which is conferred upon the most distinguished graduate of the year. After holding two residencies in Edinburgh Royal Infirmary, under Sir Thomas Grainger Stewart and Prof. John Chiene, Stiles abandoned all thought of general practice. For him there was but one career—surgery. It was an uphill fight: as a disappointed father expressed it, "he must fish for himself"; but if the early baskets held meagre measure, they were filled in time to overflowing.

He entered on three fields of activity: he was a junior assistant in the department of surgery; he was demonstrator in anatomy; and he was partner with Alexis Thomson in a highly successful coach-class. Professor Chiene had recently established in his department a surgical laboratory, which afforded facilities for the infant subject, bacteriology, and a collateral which was little more advanced, microscopic pathology. It was the second of these which aroused Stiles's particular interest, but he was dissatisfied with certain of the procedures then in use, particularly the gum-and-syrup freezing method by which specimens were prepared for sections. Learning the technique of the "Naples" or paraffin-embedding method, by which embryos were prepared for examination, he was the first to adapt it to the needs of surgical pathology, and thus pursued the notable researches on carcinoma of the breast which in 1895 gained him the Walker prize of the Royal College of Surgeons of England. The extent and character of modern operations for cancer of the mamma were largely determined by this work.

Shortly after his election as assistant surgeon to Edinburgh Royal Infirmary he spent six months in the clinic of Theodor Kocher, professor of surgery at Berne. The two men became firm friends, and Stiles marked his admiration for the great Swiss surgeon by translating his *Textbook of Operative Surgery* into English. But the association had a further significance: surgery in Kocher's clinic was conducted on aseptic principles, whereas Stiles was a disciple of the Listerian school; indeed at one time he had acted as "spray clerk" with Chiene. It was a striking contrast of method, but he had no doubt which was the better; and when he was appointed surgeon to the Edinburgh Children's Hospital in 1898 he persuaded the directors to instal a steam steriliser. Some months later the Royal Infirmary made a similar provision. Thus Stiles was the medium whereby aseptic surgery was introduced to Edinburgh, and indeed to Scotland.

His acceptance of the post of surgeon to the Children's Hospital caused considerable comment. Necessitating, as it did, his resignation from the Royal Infirmary, it appeared to imply a virtual detachment from adult hospital work; but events confirmed the wisdom of his choice. Under his guidance the surgical section of the hospital became a centre which attracted widespread interest; and presently his adult hospital association was renewed when he was appointed surgeon to the Chalmers Hospital. His reputation was now established; he enjoyed a large and increasing practice as a consultant, but still found time to develop his great teaching ability and to engage in research. Against Koch, he contended that the bovine bacillus plays an important part in originating human tuberculosis, particularly in children; and the accuracy of his observation was proved by the investigations on bone, joint, and gland diseases which he initiated.

During the war of 1914–18 Stiles acted as consultant to the Army, holding the rank of colonel. He gave particular attention to the organisation of the orthopædic services in the military hospital at Bangour; and his services were acknowledged by his appointment as K.B.E. In 1919 he succeeded Caird as regius professor of clinical surgery, and thus returned to the hospital in which his surgical career had begun. But his tenure of office was brief. He believed in early retirement, particularly for surgeons, and in 1925 he resigned the chair and moved to his country home at Gullane.

At first he took up geology, with an enthusiasm equal to that which he had shown for surgery. Field work was his particular delight; he pursued it at home and abroad, and those who accompanied him on some of these occasions recall the stimulus and the inspiration which they afforded. As his physical strength declined, he resorted to botany as a pursuit which he could enjoy within the surroundings of his home. He found intense pleasure in the subject, and indeed until within a few days of his death he was busily engaged in the identification and illustration of the East Lothian flora. "Star-eyed" science was his friend until the end, and in the cover of her wings he found interest unceasing and no small measure of comfort in a world of many problems.

Stiles was a most interesting personality. Possessed of originality of mind and remarkable powers of concentration, he analysed a problem rapidly, and generally with success; and when these faculties were applied to surgery the results were almost always convincing. His technical skill was quite unusual, and here again there was evidence of accurate deductive reasoning, guiding an intimate knowledge of detail. He has our gratitude for all that he accomplished. J.F.

STANLEY DODD

M.B. CAMB., F.R.C.P., F.R.C.O.G.

Mr. Stanley Dodd, consulting obstetrician to the Westminster Hospital, consulting surgeon to the Chelsea Hospital for Women, and consulting gynæcologist to the Bolingbroke Hospital, died on April 21 at the age of 70. The third son of the late Arthur Dodd, he was educated at Eastbourne College and Caius College, Cambridge. From Westminster Hospital, where he went with an entrance scholarship, he qualified in 1902 and took his M.B. two years later. After holding house-appointments at the Westminster he served as senior R.M.O. at the Queen Charlotte's Hospital before he returned to his old hospital to join the honorary staff. His busy practice left him little leisure for writing, but for many years he was one of the Ten Teachers who compiled the well-known *Midwifery and Diseases of Women*. Much of his spare time was given to his work as an examiner for the universities of Cambridge and London, for the Conjoint Board, and for the Central Midwives Board. He was elected to the fellowship of the Royal College of Obstetricians and Gynæcologists in 1929 and of the Royal College of Physicians of London in 1932.

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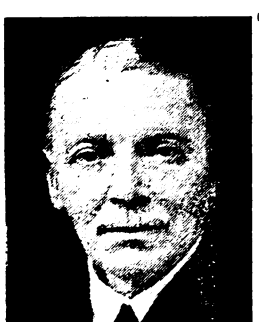
"In the twenty-five years that I knew Stanley Dodd," writes A. G., "I never saw him lose his temper and never heard him say an unkind word about any of our colleagues and friends. He was not hail-fellow-well-met with everyone, but he had about him a kind and gentle serenity that won for him the love of all. A model chief of a department, he never missed his clinics or his operating sessions, and his regard for punctuality was almost an obsession. An excellent teacher and a wonderful diagnostician, he had the rare bedside manner in its best sense, and could make the most humble and the most exalted feel that to him she was a friend and not just a patient. One of the first enthusiasts for radium therapy, he kept a little fund subscribed to by those more fortunate for the benefit of those of his patients who could not afford to take advantage of this new hope. He devised several methods of gynæcological radium therapy which opened the way for even further means of application, but before he retired he had rightly assigned the use of radium to its present and proper level. As an obstetrician he was a true comforter in time of trouble and a master in finding the way out of difficulty. As a gynæcologist, apart from his amazingly deft fingers in diagnosis, he was a fine abdominal surgeon, quick, neat, and safe. When he retired, some years before he need have done, we all knew that he had worked himself out. And it seemed only fair that he should have a little more than the allotted time to enjoy the things that, after his work, he loved the most—the simple country life with its gardening (he had a green finger) and its shooting (he was a fine shot)."

Mr. Dodd married in 1912 Miss Phyllis Embury and they had one son.

SYDNEY PRICE JAMES

C.M.G., M.D. LOND., F.R.S.

IN the treatment and prophylaxis of malaria no authority was more widely known and honoured than Lieut.-Colonel S. P. James. He joined the Indian Medical Service in 1896, a year after he qualified at St. Mary's Hospital, and early won his spurs in research. Not only was he among the first to study mosquitoes, but while in medical charge of a Moplah regiment in Travancore he observed the passage of the mature filaria embryos into the proboscis of the infected mosquito, a discovery anticipated a few months earlier by Low, working in London. In 1902 James was attached to the malaria commission of the Royal Society and Colonial Office, and two years later he was appointed statistical officer with the government of India. In his spare time, with Liston, he collected the material for their *Monograph of the Anopheles Mosquitoes of India* (1904), which for a decade informed and stimulated all engaged in this field.



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More and more of his time was taken up with the organisation of research in India, and after the Imperial Malaria Congress, held at Simla in 1910, James, as virtual secretary in the research department, played a large part in setting up in the eight provinces organisations which carried out what amounted to a general malaria survey of India. He was also first editor of *Paludism*, the prototype of the present *Records of the Malaria Institute of India*.

In 1911 India was much concerned with the possible introduction of yellow fever to the East as a result of the opening of the Panama Canal, and James was placed on deputation to study conditions in Central America and in the principal seaports between that country and India. The extensive experience he then gained was of use when later he became a member of the permanent committee on yellow fever of the Office International d'Hygiène Publique, and president of its Yellow Fever Commission. In 1913, on request from the Ceylon government, James was sent to initiate measures against mosquitoes in Colombo.

At the outbreak of the 1914–18 war James was in England on sick-leave and was retained to help organise hospitals for Indian troops. In 1916, however, when sanitary arrangements in Mesopotamia were causing anxiety, he was appointed to organise the bacteriological services in that country. Unfortunately in the autumn, after establishing the central laboratory at Basra, he contracted cholera and had again to be sent on sick-leave. This second serious illness no doubt affected his decision in 1918 to accept the offer of the appointment of medical inspector and adviser on tropical diseases in the Local Government Board (now the Ministry of Health) and to retire from the I.M.S.

James's active participation in malaria work might now have seemed at an end. Instead he created at Horton a great centre of malaria research.

"It is just 21 years ago," writes W. D. N., "that the Ministry of Health Malaria Laboratory was established at Horton Hospital, by arrangement with the London County Council and the Board of Control, under the guidance and influence of James, who was not only a fine teacher but a careful research worker. The work started in a small way—the laboratory was a make-shift affair in a disused pantry. It was a delight to listen to James's enthusiasm, and his frequent visits, often with malariologists from all parts of the world, brought fresh knowledge in the exchange of views and experience from other workers. He was quick to realise the opportunities afforded for research, and it is now 14 years since the first experiments in prophylaxis in malaria were carried out, first with plasmoquine and then with atebrin (mepacrine), in close collaboration with Schulemann and Kikuth from the Elberfeld Laboratories at Cologne. Here in Horton through James's genius were sown the seeds of prophylactic work which made it ultimately possible for warfare to be carried on in the jungle. When Singapore fell and supplies of quinine were cut off, it appeared to some that military operations in highly malarious areas would be nearly impossible. However, the work of James and his colleagues between 1932 and 1935 had shown clearly that in mepacrine we had a drug which was far more effective than quinine prophylactically and equal or superior therapeutically, particularly against malignant tertian malaria, and it is no exaggeration to say that his research on mepacrine was a contribution of tremendous importance during the recent war."

James was an influential member of the Malaria Commission of the League of Nations; in 1927 he returned to India as a member of the Fletcher Commission on the organisation of medical research, and in 1929 he visited East Africa on behalf of the Colonial Office to advise upon measures against malaria. He was elected fellow of the Royal Society in 1931, and three years later was Prix Darling laureate of the League of Nations. He was created C.M.G. in 1935, and was president of the Royal Society of Tropical Medicine and Hygiene 1937–39.

When he retired from the Ministry in 1936, free at last to devote himself to research undisturbed by administrative duties, he moved to Cambridge to work at the Molteno Institute. There, when studying a new plasmodium of chicks, the now well-known *P. gallinaceum*, he noted non-pigmented forms in cells other than the erythrocytes, and with Tate was among the first to describe and work upon these forms, which have since proved so important.

James's health latterly was not good, and during the early days of the war he left Cambridge for Bosham, where he used to yacht. But he soon threw himself again with all his old enthusiasm into the question of the treatment and prophylaxis of malaria in the Forces and he became an active member of many committees. To his logical mind the means to cure malaria, or still better to bring about "causal" prophylaxis—i.e., destruction of the injected sporozoites so that malaria did not develop—was the most urgent requirement of the time, and to the end he laboured unsparingly on this problem. He died at Bosham on April 17.

Sir Rickard Christophers, to whom we owe much of this memoir, writes: "If James thought action ought to be taken no trouble was too great to see it through. Seemingly easy-going, he had strong ideals and he never spared himself. As a writer he had a style which seemed simple because of its clarity, and he was a good

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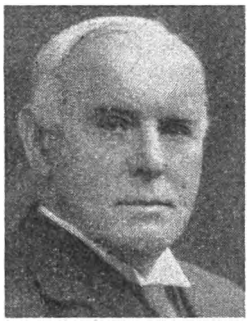
speaker, able to carry his audience. He could be ingratiating, but also on occasion caustic, and under a somewhat misleading appearance of quietness and gentleness lay intensity and indomitable will."

DOUGLAS CHALMERS WATSON

M.D. EDIN., F.R.C.P.E.

THE sudden death, in his 76th year, of Chalmers Watson on April 7, at his home at Fenton Barns, East Lothian, has removed a striking personality.

His heredity and early environment (both subjects of particular interest to him) were directly reflected in his life's work. His father was a respected practitioner in West Lothian; his mother came of a well-known Lothian agricultural family; and together they kindled in him an early enthusiasm for both medicine and agriculture. With this liberal education he developed a sense of perspective which enabled him to see the art and science of medicine in its relation to the whole range of biology. Width of outlook was one of his characteristics.



Bacon

He was educated at the village school at Mid-Calder, George Watson's College, and Edinburgh University, where he was awarded the Wightman prize in clinical medicine on graduation in 1892. As house-physician to Sir Thomas Fraser and Sir Byrom Bramwell at the Royal Infirmary, and to Burn Murdoch and Joseph Bell (Conan Doyle's prototype of Sherlock Holmes) at the Royal Hospital for Sick Children, and as clinical assistant to distinguished pioneers, such as Argyll Robertson, in various special departments in the Edinburgh school of half a century ago, he laid the foundation of a wide knowledge and a scientific approach to medicine. Recognition of his ability came early when he became editor of the *Encyclopædia Medica* only eight years after graduation.

His inquiring mind soon turned towards research—a purpose which he pursued with undiminished enthusiasm until the last days of his life. His earliest investigations were in the province of organotherapy, and in 1900 he submitted a M.D. thesis on the value of bone-marrow extract in the treatment of certain chronic skin diseases. At the beginning of the century he began in the laboratories of Sir Edward Sharpey-Schafer his lifelong study of the problems of nutrition. His initial inquiries were concerned with the variations in health of laboratory animals and the influence of various diets on tissue histology; and in 1905 the merit of this work was acknowledged in the award by the Philadelphia College of Physicians of the Alvarenga prize. Chalmers Watson's theme was the influence of variations of diet on the tissues and organs of the body; and the work on which it was founded was closely allied to the researches which culminated in the discovery of vitamins.

In 1907 he was appointed assistant physician to the Royal Infirmary, Edinburgh, which he continued to serve for more than a quarter of a century. During these years he was recognised as an able clinician and a teacher of distinction; he inspired successive generations of students by his enthusiasm, his clarity of exposition, and his originality of thought. He had a deep understanding of human nature and a unique capacity for imparting it to others.

His constant interest in clinical research was evident in the number and range of his publications. They included papers on gout and rheumatism, the food requirements of children, the manifestations and treatment of intestinal toxæmia, bacteruria in children, the rôle of autointoxication and focal sepsis in mental disorders, the vital factor in diet, the therapeutic value of irradiated milk in the treatment of rickets, the influence of the Gerson diet on tuberculosis and other diseases, and the nature of vitamins. In addition, he was the author of *Food and Feeding in Health and Disease* and *The Book of Diet.*

He showed equal initiative in the sphere of social medicine. Perceiving the lack of suitable hospital facilities for those of moderate means, he obtained a charter for the foundation of the Queen Mary Nursing Home in Edinburgh, which was to be the forerunner of numerous similar developments elsewhere.

His abiding preoccupation with nutrition led him inevitably to the study of agriculture, and some twenty years ago he established his famous farm and research centre at Fenton Barns. In a comparatively short time his dairy herd and farm organisation acquired an international reputation, and no-one who visited Fenton Barns could fail to be impressed by the manner in which scientific knowledge was applied to the problems of agriculture, both in research and in the practice of modern food-production. When he retired from active medical practice in 1934 he turned to biological and veterinary research; among other subjects, he investigated the properties of sprouted grain as a winter food for animals, the cause of mastitis in cattle, and, more recently, the problem of soil nutrition. In all this work he had the keen coöperation of his wife, Mona Geddes, M.D., the sister of Sir Eric Geddes and Lord Geddes.

It was characteristic of him that, although crippled by advanced osteoarthritis of both hips, he continued personally in the conduct of research; and indeed until a few days before his death he was working in laboratories in Cambridge and Glasgow on the vital properties of urine. He was sceptical of the accepted theories concerning diet and vitamins, and for many years had held that foodstuffs gained their vital energy from the electromagnetic waves of the sun. He took the view that this electronic energy was stored up in fresh foodstuffs and was utilised by the endocrine system. As a result of his latest investigations he believed that he was able to demonstrate photographically the ionic pattern in urine which indicated the presence of electronic activity, and he was concerned with the application of this method to medicine and to science generally.

His views and theories met with much opposition and stimulated criticism; but all who knew him admired his pertinacity, his geniality, and his enthusiasm. He was an individualist who almost preferred to hold views different from his colleagues; an orator whose facility in debate was exceptional; a sportsman who promoted the establishment of hockey in Scotland and whose ability on the tennis-court, even at an advanced age, was outstanding; a keen supporter of all student activities both social and athletic; and an ardent advocate in pre-war years of reform of the medical curriculum.

By his first marriage Dr. Chalmers Watson had two sons, one of whom now manages the family farms. In 1938 he married Miss Lily Brayton, the actress, who survives him.

PHILIP PAINE MURPHY

M.B. DUBL., D.T.M. & H.

Dr. Philip Murphy, who died on April 7 at Aden, where he was in charge of the civil hospital, was born at Coolgreany, co. Wexford, in 1910, the son of Dr. W. W. Murphy. He graduated M.B. at Trinity College, Dublin, in 1932, and after holding house-appointments at Wolverhampton and Cheltenham he joined the Colonial Medical Service in British Somaliland in 1935. At the beginning of his third tour of service in 1939 he was transferred to Aden as medical officer, becoming in turn port health officer, acting senior medical officer, acting D.M.S., and surgical specialist. His surgical skill was known all over Southern Arabia, and the number of patients at the civil hospital was almost trebled under his charge. Though the war years, with shortage of staff and extra work, bore hard on him he never spared himself or lowered his standards. An all-round games player he was also an expert shot, a good horseman, and a keen fisherman. The following memoir appeared in the *Aden Argus* of April 13: "Murphy was frank and direct both in thought and speech. Anything underhand, slipshod, careless or unnecessarily complicated was abhorrent to him. . . . He took infinite pains to find out everything he could about whatever task he had in hand, by reading, questioning, observation and practice. . . . He was always anxious to experiment, but never to the danger of those who put themselves in his hands and he never promised or claimed to be able to do more than he knew himself fully competent to carry out successfully."

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Notes and News

THE RETREAT

WHEN William Tuke, in 1796, opened his "retired habitation" for the mentally ill, the patients and staff were together known as "the family." He was, of course, our English pioneer in the human treatment of the insane, and at the Friends' Retreat at York his principles were carried out with unflagging courage at a time when the insane were dreaded as dangerous. In a little book,[1] written after a visit to the Retreat, L. A. G. Strong tells of one of these early patients who on admission had been in chains so long that he had almost lost the use of his limbs. When a friend asked him what he called this place where he was allowed to walk freely about, he replied, "Eden! Eden! Eden!"

The early spirit in which this mental hospital was founded has never failed, and now, 150 years later, it maintains the family relationship while making full use of modern psychotherapeutic techniques. The great achievement of the Retreat has been conscious dedication to the belief that man has a spirit as well as a body and mind, and that the three must be treated together. Nineteenth-century mechanism left this belief unshaken, and it remains the foundation of the hospital's work today.

In honour of the anniversary a gathering is to be held at the Retreat on May 11, when Dr. Henry Yellowlees will give an address entitled Hitherto and Henceforth. A tree will be planted in the grounds by Mr. Anthony W. Tuke, great-great-great-grandson of the founder. On May 12 a service will be broadcast from the Friends Meeting House, York, and on May 21 a public meeting will be held at Friends House, London, in coöperation with the Churches' Council on Divine Healing. As a complimentary gesture, in this anniversary year, the Royal Medico-Psychological Association is holding a quarterly meeting at the Retreat on May 16 and 17, and the Association of Registered Hospitals in England will hold its annual meeting there on May 15.

PHOTOGRAPHING THE ATOM

AT a joint meeting of the Association for Scientific Photography and the Royal Photographic Society in London on March 28, Mr. C. W. BUNN described attempts to record atoms photographically. Direct recording, which had not yet been achieved, would need, he said, some form of high-power microscope. The ordinary optical microscope was useless because the shortest light waves were too long to be affected by atoms; on the other hand, X rays, though their wave-lengths were short enough, could not be bent by any known lens to form an image. The answer could be provided by the development of the electron microscope to give a higher resolving power; ribbons of matter only 2 molecules thick had already been recorded, and another 50-fold increase of resolving power should be sufficient to record atoms themselves.

An indirect method of recording atoms had already been devised by employing X rays, which, though not bent to form images, did form diffraction patterns. If these patterns were used to direct rays of white light along the right paths, an image of the atoms could be formed in this second stage. While providing no direct image, this method did give a genuine image when the atomic pattern was regular, as in crystals. This technique had not been widely applied, but the reverse method, which was also due to Sir Lawrence Bragg, had been found invaluable. This was known as the "fly's-eye" method, because of the optical system used. A picture was drawn to represent the probable arrangement of atoms in a crystal. From this, by means of a pattern of hundreds of pinholes or lenses resembling a fly's eye, a diffraction pattern was made by monochromatic light, which could be compared with the diffraction pattern made with X rays by the original crystal; if the two were identical, then the atomic arrangement had been correctly deduced. This technique had been used to confirm the structure of the sodium salt of penicillin.

ON Saturday, May 11, at 3 P.M., at Denison House, 296, Vauxhall Bridge Road, London, S.W.1, the Socialist Medical Association is holding a meeting on the National Health Service—the Profession and the Public. Mr. Somerville Hastings will be in the chair, and the speakers are to be Dr. Stephen Taylor, Dr. Horace Joules, and Dr. Philip Inwald.

1. Light Through the Cloud. Friends Book Centre, Euston Road, London, N.W.1. 5s.

University of Dublin

Mr. Adams Andrew McConnell has been appointed regius professor of surgery in the university in succession to the late Sir Arthur Ball.

Royal College of Physicians of London

At a comitia of the college held on April 25 with Lord Moran, the president, in the chair, the following were elected to the fellowship:

T. F. FOX, London; PERRIN H. LONG, Baltimore; R. E. ROBERTS, Liverpool; ANDREW TOPPING, London; G. C. LINDER, Rondebosch; K. S. HETZEL, Adelaide; H. S. LE MARQUAND, Reading; GLADYS WAUCHOPE, Hove; Lord AMULREE, London; L. C. HILL, Bath; WILFRED EVANS, M.C., Sydney; F. B. PARSONS, Cambridge; E. W. ANDERSON, Exeter; E. G. ROBERTSON, Melbourne; G. G. E. SMYTH, Blackburn; R. FREELAND BARBOUR, Bristol; ARTHUR WILLCOX, Sidcup; A. MORTON GILL, London; F. AVERY JONES, London; ALICE STEWART, Cardiff; C. G. PARSONS, Birmingham; W. T. COOKE, Birmingham; IAN GORDON, Aberdeen; G. W. HAYWARD, London; E. E. POCHIN, London; J. W. ALDREN TURNER, London; K. O. BLACK, Poona, India Command; ALAN KEKWICK, London; E. R. A. MEREWETHER, London; A. J. ORENSTEIN, C.B., C.M.G., C.B.E., Johannesburg; J. D. ROBERTSON, London; EMANUEL MILLER, London; ROBERT CRUICKSHANK, London; F. R. G. HEAF, London; JOHN MCMICHAEL, London.

Dr. James Mackintosh was appointed representative of the college at the health congress of the Royal Sanitary Institute, Dr. A. A. Moncrieff on the medical advisory committee of the Colonial Office, Lord Moran on the governing body of the British Postgraduate Medical School, Dr. W. S. C. Copeman on the committee of management of the Chelsea Physic Garden, Dr. F. S. Langmead on the Central Midwives Board, and Dr. J. Bishop Harman on the committee of reference and the Central Medical War Committee. The president reported that he had nominated a committee to consider the prevention and management of rheumatic heart diseases.

The following having satisfied the censors' board were admitted to the membership:

Mitri Abdel-Malik, M.B. Cairo; M. Z. Ahmad-Souidan, M.B. Cairo; F. P. Antia, M.D. Bombay; Anthony Batty Shaw, B.M. Oxfd; W. D. Brinton, B.M. Oxfd; J. B. Cavanagh, M.B. Lond.; Jack Colover, M.B. Lond.; G. M. Colson, B.M. Oxfd; Emmanuel Cronin, M.D. Camb.; J. H. Dadds, M.B. Lond.; A. J. Daly, M.D. Camb.; P. R. C. Evans, M.B. Lond.; F. J. Flint, B.M. Oxfd; P. B. S. Fowler, B.M. Oxfd; J. P. Gemmell, M.D. Manitoba; P. W. Hardie, M.D. Toronto; H. F. Harwood, M.D. Lpool; M. A. Jalili, M.B. Bagdad; W. E. J. Jones, M.D. Lpool; J. W. Landells, M.B. Camb.; E. H. Larkin, M.B. Sydney; S. H. Llewellyn Smith, B.M. Oxfd; M. J. G. Lynch, M.B. N.U.I.; M. B. Matthews, M.B. Camb.; B. E. Miles, M.B. Camb.; R. I. Milne, M.B. Camb.; J. D. N. Nabarro, M.B. Lond.; Lucy M. B. Nelson, M.B. Lond.; D. P. Nicholson, M.B. Lond.; Samuel Oleesky, M.B. Manc.; W. S. Peart, M.B. Lond.; L. G. Picciotto, M.B. Cairo; T. R. E. Pilkington, M.B. Lond.; R. J. P. Pugh, M.B. Birm.; Elizabeth V. Rohr, M.B. Lond.; D. W. Smithers, M.D. Camb.; P. N. Taneja, M.D. Punjab; Deryck Taverner, M.B.E., M.D. Leeds; D. J. Thomas, M.B. Lond.; C. B. M. Warren, L.R.C.P.; Marcia I. P. Wilkinson, B.M. Oxfd; K. A. A. Wray, M.B. Camb.; C. H. Wyndham, M.B. Witwsrand; R. K. W. Yang, M.B. Edin.; John Yudkin, M.D. Camb.; J. V. Zammit-Maempel, M.D. Malta.

Licences to practise were conferred upon the following 125 candidates (93 men and 32 women) who have passed the final examination of the Conjoint Board:

Queenie M. F. Adams, Jack Aminoff, Robert Armatage, J. N. Badham, J. K. Baird, Roberta S. J. Baker, D. V. T. Baldwin, D. H. Barnbrook, M. S. Bentley, A. J. Berman, Peter Blackledge, A. G. Brown, John Butler, A. R. C. Butson, Margaret J. S. Caton, Monica L. Chalmers, Jack Chalom, G. B. Chamberlain, A. O. Chase, I. C. Church, J. F. Cleobury, Betty L. Coles, A. P. Cornwell, L. T. Cotton, John Cox, M. I. Cox, J. L. Crammer, D. T. Crook, R. R. Davis, Nina Dawson-Reid, J. F. Delafresnaye, D. J. Dennison, W. R. Denny, R. de A. Denton-Cardew, Margaret M. Dickinson, J. H. O. Earle, Hilda A. Elman, J. B. D. Evans, H. S. Eyre, A. J. Fouracre, Joan E. Garside, J. Z. Garson, Dorothea E. Garwood, Marjorie Golomb, F. R. Goodwin, R. V. H. Goulder, Joyce F. Grant, I. R. Gray, E. P. Hall, Joyce Hauscomb, Dorothy A. Harvey, J. R. Hawkings, T. D. Hawkins, L. M. Henry, C. W. J. Hingston, K. J. Hoffmann, Philippa A. Howard, D. H. Isaac, J. P. Jackson, Gillian F. Jacob, Maureen B. Jeffrey, Peter Jordan, Ellen M. Knight, Barbara M. Leach, G. L. Leathart, R. E. Leighton, T. R. Littler, Joan N. Mackover, H. R. Macleod, Brian MacMahon, Anne Maguire, I. W. H. Mansfield, Joan C. Mason, J. W. B. Matthews, J. G. Millichap, M. L. Montagnon, J. D. Montagu, R. A. Morris, A. H. G. Murley, D. P. North, Herbert Nussbaum, D. W. J. O'Neill, Otokar Pacovsky, Hilary C. Parton, Framjee Patuck, Phyllis H. Phipps, Margaret H. Pond, M. J. Raymond, J. A. Reynolds, E. F. W. Richards, Stella M. Ring, K. D. Roberts, Gwyn Robins, Michael Roper, J. D. S. Rowntree, F. C. W. Royle, J. N. Sampson, P. R. B. Sankey, R. O. K. Schade, O. C. A. Scott, R. F. M. Seaborn, F. W. R. Seward, V. E. Sherburn, Alice M. Sibly, D. R. Smith, Pamela M. Smith, John Sutcliffe, Bernice A. Tanner, J. J. Teeuwen, R. G. Thomas, L. F. Tinckler, J. K. Trotter, Jeffrey Walsh, J. I. Wand-Tetley, E. H. P. Warburton, Sylvia D. M. Waters, W. R. Wardill, A. P. H. Wilkinson, R. H. L. Wolfsohn, F. J. Woodley, Ann Wyatt, H. W. Wyile, P. M. Yap, Stella Yeomans, S. C. B. Yorke.

Diplomas in ophthalmic medicine and surgery and in physical medicine were granted to the candidates named in the report of the meeting of the Royal College of Surgeons

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in our issue of March 23 (p. 445). The following diplomas were also conferred jointly with the Royal College of Surgeons:

D.M.R-D.—J. C. Bishop, J. D. Dow, N. E. Dunn, E. E. Faerber, M. H. Fainsinger, K. H. Gaskell, H. B. Howell, G. B. Locke, V. G. Peckar, G. W. Pimblett, G. L. Rolleston, O. E. Smith.

D.M.R-T.—W. G. Evans.

D.T.M. & H.—J. G. Makari, G. J. Murray.

D.C.H.—Enid I. M. Addenbrooke, Sheila W. Anderson, Muriel C. Andrews, Margaret M. Ballantine, Laura M. Bates, D. W. Burnford, Ethel F. Caplan, Sujata Chaudhuri, J. D. Cruikshank, Barbara S. Davies, A. M. D'Cotta, Elizabeth S. A. de Wit, Constance M. Duddle, S. P. Dundon, H. L. Le V. D. Durell, Frances M. Earle, B. E. Finch, J. E. Francis, Margaret Garnett, Elinor Ginsbury, P. R. Headley, Gavin Hildick-Smith, Dorothy D. Jones, H. M. Khan, Shafik Koweity, Winifred M. Markham, Nancy S. Marshall, Brian McNicholl, Margaret Middleton, Joyce B. Mole, Dayanand Naidoo, Catherine A. Neill, Charles O'Donovan, Christopher Ounsted, Eileen E. Perry, Mildred I. Pott, T. H. Powell, Máire M. Pugh, John Revans, A. P. Roberts, Doreen C. B. Stevenson, G. L. Stumbles, Janet Sutherland, P. N. Taneja, Megan J. Tanner, Mary Townsend, Morwenna M. Tunstall-Behrens, Patricia B. Vicary, J. R. D. Webb, Mary E. Wehner.

Society of Apothecaries of London

At a recent meeting of the court of assistants, with Dr. Hugh F. Powell, the master, in the chair, Neville Samuel Finzi and Macdonald Critchley were elected to the court. Dr. J. P. Hedley was reappointed as the society's representative on the Central Midwives Board.

The following were clothed by the master with the livery of the society: Raymond Francis Townsend and Arthur Espie Porritt. The following were admitted to the freedom of the society: by redemption, Paul Creighton Alexander, Edward Cecil Brearey Ibotson, and Robert Michael Maher; by patrimony, Francis Stephen Benthall.

The diploma in industrial health, honoris causa, has been granted to Dr. A. J. Amor, Dr. John C. Bridge, Prof. F. A. E. Crew, Dr. Margaret Dobbie-Bateman, Dr. M. W. Goldblatt, and Dr. E. R. A. Merewether.

The diploma of licentiate was granted upon examination to: E. T. De Mel, J. S. E. Gilbart, J. J. Maskell, M. Lakner, P. F. Osborne, A. M. Benson, R. Hodgkinson, K. R. Brookes, R. A. Armstrong, and E. H. Osborn-Smith.

Refresher Course in Paris

Those who consider attending the three-day course on recent advances in medicine at the Hôpital Broussais, which was announced in our columns last week, may obtain information from the Scientific Office, French Embassy, 1, Carlton Gardens, London, S.W.1 (Whitehall 5444, ext. 403).

French Dermatology Meeting

The Société Française de Dermatologie et de Syphiligraphie will meet at 10 A.M. on May 8, at the St. Louis Hospital, Paris, to discuss the Treatment of Cutaneous Tuberculosis by Vitamin D_2 in High Dosage. The committee of management have invited members of British dermatological societies to attend the meeting. Dr. R. Degos, secretary of the society, may be addressed at 20, rue de Penthièvre, Paris VIII.

British Homœopathic Association

The association is to hold a conference at the Bonnington Hotel, Southampton Row, London, W.C.1, on May 4, at 11 A.M. The position of the homœopathic doctor in the "State Medical Service" will be discussed.

Medical Diary

MAY 5-11

Tuesday, 7th

CHELSEA CLINICAL SOCIETY
7 P.M. (South Kensington Hotel, 41, Queen's Gate Terrace, S.W.) Brigadier Glyn Hughes: Germany before and after Capitulation.

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE
5 P.M. (Royal Infirmary.) Prof. N. Feather, F.R.S.: Uranium and Neutrons: the Production of New Elements and Old.

Wednesday, 8th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
4.30 P.M. *Physical Medicine.* Dr. G. D. Kersley: Acute Arthritis in Adults.

ROYAL SOCIETY OF ARTS, John Adam Street, Adelphi, W.C.2
1.45 P.M. Mr. A. S. Parkes, SC.D., F.R.S.: Hormones.

MEDICAL SOCIETY OF THE L.C.C. SERVICE
2.30 P.M. (County Hall, Westminster Bridge, S.E.1.) Mr. R. V. Lewys-Lloyd, Mr. J. Gabe, and Mr. J. C. Gillies: Treatment of Minor Injuries and Infections of the Hand.

UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Dr. H. N. Munro: Capillary Fragility.

Thursday, 9th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. D. H. MacLeod: Endometriosis—a Surgical Problem. (Hunterian lecture.)

Friday, 10th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Clinical.* (Cases at 4 P.M.)

Medical Women's Federation

A meeting of the London Association of the federation was held on April 28 to discuss the National Health Service Bill. Miss E. H. Jebens (speaking as a consultant), Miss M. Warren (deputy medical director of the West Middlesex County Hospital), Dr. Mary Hellier (general practitioner), Dr. Mary Hirst (deputy M.O.H. for Islington), and Dr. Mary Esslemont (representative of the federation on the Negotiating Committee) replied to the points in the discussion. All the speakers welcomed the coördination of the hospital services, but there were many criticisms, particularly of the proposals affecting the general-practitioner service. Miss Jebens moved that each hospital should have its board of governors, should be empowered to retain its own endowments, and should have its own advisory medical committee, and that a wholly full-time consultant service was undesirable. Dr. Hellier proposed a resolution objecting to any proposal that would lead to a whole- or part-time salaried service for general practitioners; she deplored their proposed control. These resolutions were passed and will be sent to the executive of the federation for the instruction of their representative on the Negotiating Committee.

The Medical Women's Federation will award, in the autumn, two grants, one of £50 and one of £25, or one grant (of £75) from its Christine Murrell postgraduate fellowship fund. Applications are invited from women general practitioners who are members of the federation. Applications should reach the secretary, 73, Bourne Way, Hayes, Bromley, Kent, not later than Aug. 31.

The Problem of Displaced Persons

A Chadwick lecture will be given at the Alliance Hall, Palmer Street, Westminster, on May 7, at 2.30 P.M., by Major Eyre Carter, of the National Council of Social Service. Major Eyre Carter will speak on the Rehabilitation of Displaced Persons, and its Hygienic Bearings.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Dr. BERTRAM H. JONES, 47, Queen Anne Street, Cavendish Square, W.1.

Mrs. W. A. MILL, M.S., F.R.C.S., 22, Harley Street, W.1 (Langham 1923).

Dr. KEMBALL PRICE, York House, 13, Palmeira Avenue, Hove, Sussex.

Appointments

BOWEN, C. W., M.R.C.S.: resident aural registrar, Hospital for Sick Children, Great Ormond Street, London.

DONOVAN, T. S., M.B. Birm., M.CH.ORTH. Lpool, F.R.C.S.E.: orthopædic surgeon, Kidderminster and District General Hospital.

KILPATRICK, J. A., M.B. Glasg., F.R.C.S.E.; assistant ear, nose, and throat surgeon, Chester Royal Infirmary.

OVERTON, JAMES, M.D. Leeds, M.R.C.P.: chief clinical assistant, dermatological department, Leicester Royal Infirmary.

Births, Marriages, and Deaths

BIRTHS

ANDERSON.—On April 20, at Birmingham, the wife of Dr. T. M. Anderson—a son.

BAILEY.—On April 20, in London, the wife of Dr. R. H. Bailey—a son.

GODDARD.—On April 17, at Templecombe, the wife of Dr. P. W. D. Goddard—a son.

LEWIS.—On April 20, at St. John's, Jersey, the wife of Dr. J. E. Lewis—a daughter.

MCALPINE.—On April 23, in London, the wife of Dr. Douglas McAlpine—a son.

NOLAN.—On April 21, at St. Austell, the wife of Dr. J. P. Nolan—a daughter.

PRATT.—On April 23, in London, the wife of Dr. E. P. Pratt, Sudan Medical Service—a son.

REEVES.—On April 19, at Plymouth, the wife of Dr. R. G. W. Reeves, R.A.M.C.—a daughter.

SEATON.—On April 5, in Dublin, the wife of Dr. Philip Seaton—a daughter.

TRETHOWAN.—On April 23, in London, the wife of Captain W. H. Trethowan, R.A.M.C.—a daughter.

MARRIAGES

FORSTER—ROSEVEARE.—On April 23, at Onitsha, the Rev. Charles A. Forster, M.A., to Margaret P. Roseveare, M.B.

HARPER—SHATTOCK.—On April 27, Eric Imlay Harper, M.A., M.B., of Aberdeen, to Marita Shattock, B.A., B.M.

DEATHS

BROWN.—On April 18, at St. Albans, David Brown, M.D., B.Sc. Lond.

CORBETT.—On April 24, at Torquay, Henry Robert Corbett, M.B. N.U.I., formerly of Plymouth, aged 82.

O'LEARY.—On April 22, at Limpsfield, Ralph Daniel O'Leary, M.B. Melb.

WHYTE.—On April 26, Frederic Hamilton Whyte, M.CH. Belf., F.R.C.S.I., lieut.-colonel I.M.S.

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LEUKÆMIA TREATED WITH URETHANE
COMPARED WITH DEEP X-RAY THERAPY

EDITH PATERSON M.B. Edin., F.R.C.P.E.
ALEXANDER HADDOW M.D., D.Sc., Ph.D. Edin.
INEZ AP THOMAS M.B. Manc., D.M.R.
JEAN M. WATKINSON B.Sc. Lond., M.R.C.S.

From Christie Hospital and Holt Radium Institute, Manchester, and Royal Cancer Hospital (Free), Fulham Road, London

AFTER experimental work[1] on the growth-inhibiting effects of urethane (ethylcarbamate) on animal tumours, it was decided in 1943 to test the drug in advanced cases of malignant disease in man. In some of these a fall in the leucocyte count was noticed, and this suggested the trial of urethane in patients with leukæmia.

This paper summarises the effects produced in leukæmia and compares the findings with the effects of standard X-ray therapy. A few cases were also treated with isopropylphenylcarbamate. Results of the use of these substances in breast cancer and other forms of advanced malignant disease are also given. Because of intolerance, mainly shown by nausea and vomiting, it proved impossible to administer urethane by mouth in doses proportional, on a weight basis, to those given by injection in experimental animals. In most cases the drug was dispensed in the following manner, which experience showed to be fairly satisfactory :—

Urethane	1·0 g.
Syr. aurant. (spec.)	1·5 c.cm.
Aq. chlorof. to	15·0 c.cm.

Syr. aurant. (spec.) was prepared as follows :—

Ess. aurant. no. 1 (W. J. Bush)	12·0 c.cm.
Syr. simplex to	120·0 c.cm.

MYELOID LEUKÆMIA TREATED WITH URETHANE

We treated 19 cases of myeloid leukæmia (10 in males and 9 in females), of which 18 were chronic, symptoms having lasted 1–33 months before treatment with urethane; one (case 13) was regarded as acute myeloblastic leukæmia. The mean period of observation has been six months; 1 case having been observed for eleven months since treatment started, and the rest for shorter periods. Details of all cases are given in table I, and figs. 1–5 illustrate the white-cell counts and hæmoglobin levels in some of them; 5 patients had previously had deep X-ray therapy to the spleen and had relapsed; 6 (cases 14–19) had X-ray treatment after a trial of urethane; these will be discussed below.

Cases Treated with Urethane only.—The following remarks summarise the findings in 13 patients who had no subsequent X-ray therapy and whose response to urethane can therefore be assessed over a longer period. All showed undoubted response to the drug, in that a dramatic fall took place in the white-cell count. Dosage was determined by the tolerance of the patient and by the rate of drop of the white-cell count. The amount of urethane necessary to produce a fall to about 20,000 white cells per c.mm. varied within wide limits (from 19 g. to 134 g.); this amount could not be correlated with body-weight nor with the absolute diminution in number of white cells.

The time taken for the white-cell count to fall to about 20,000 per c.mm. varied between eleven and thirty-six days, the average being thirty days. There was one exception (case 3, the only child in this series), in which the count did not fall below 20,000 until ninety-eight days had elapsed. Differential white-cell counts before and after treatment showed that the greatest percentage fall affected the myeloblasts and premyelocytes, which in most cases disappeared; myelocytes were apparently the next most sensitive, and then metamyelocytes, while the adult polymorphs were the most resistant. The only acute myeloblastic leukæmia in the series (case 13) showed a reduction in the absolute myeloblast count to 0·2% of the original figure, although the proportion of myeloblasts to total white cells remained at over 90%.

The hæmoglobin value rose by an average of 16·6% (100%=13·8 g. Hb per 100 c.cm.) in 10 cases, remained stationary in 1 case, and fell in 2 (mean fall 9·5%). Of the 10 patients alive in October, 1945, 8 showed a mean rise in hæmoglobin of 28% and 2 a fall of 2%. It is obviously important, in assessing the value of a drug which affects the white cells, to evaluate any effect whether immediate or ultimate on the red-cell series also. If the effect at two months is examined in relation to the size of dose administered, it is found that those patients who had been given over 100 g. of urethane attained an average increase of 27% in their hæmoglobin; this excludes 1 case in which a serious drop had occurred. Those patients who received less than 100 g. of urethane showed an average rise in hæmoglobin of only 11%.

In spite of these values, which do not indicate harmful effects on the red-cell series, and which show a greater rise of hæmoglobin in those patients who had a greater dose of the drug, 2 cases suggest that deleterious effects can arise. Case 3 (fig. 2) had a late and dangerous drop in the cells of both the white and red series after heavy dosage of urethane over a long time, but recovered with transfusions and is well six months later and at school. Case 5 died with signs and symptoms of aplasia of the hæmopoietic system, and it is felt that the drug was partly responsible. All patients were given routine iron treatment while in hospital, and blood-transfusion was given in certain cases indicated in table I.

An immediate improvement was seen in all but 4 cases and was later maintained. Of the 4 patients, 3 have died, and in 1 the general condition is stationary. Before treatment the spleen was grossly enlarged in all cases, in several almost filling the abdomen; after treatment its size was much reduced (figs. 6–8), and in some cases the spleen became impalpable.

Cases Treated with Urethane and X-ray Therapy.—In 6 of the 19 cases X-ray therapy was given after a trial of urethane; in 2 (cases 16 and 17) it was given because the response to the drug appeared inadequate and both of these responded well to radiation. In case 14 the white-cell count was falling, but nausea from urethane was severe. This patient continued to respond well while on X-ray therapy. Cases 15 and 19 were given X-ray therapy at the end of a remission following urethane treatment. Case 19 responded well to X rays (fig. 5). Case 15 had been treated with urethane because of his eventual lack of response to X-ray therapy, and subsequent X-ray therapy was equally unsuccessful. This patient is alive but is deteriorating. Case 18, when her condition worsened, was given a course of X-ray therapy, which was incomplete and without response. Cases 15 and 18 were both terminal when treatment was instituted with urethane or with X rays.

Side Reactions.—Nausea was present to some degree in 9 of the 19 cases, and accompanied by vomiting in 5. This symptom was relieved when the drug was given per rectum. Diarrhœa occurred in 2 cases, in 1 of which there was an intercurrent salmonella infection. Slight drowsiness was observed in 1 case.

LYMPHATIC LEUKÆMIA TREATED WITH URETHANE

Urethane was used in 13 cases of lymphatic leukæmia, 8 in males and 5 in females; 12 were chronic, the average duration of symptoms before treatment being fourteen months. Case 20 was in the acute terminal phase, and case 21 was classed as acute lymphoblastic leukæmia. The period of observation varied from thirty-four days to eight months, the mean being four and a half months. Details are provided in table II and in figs. 9–12.

1. Haddow, A., Sexton, W. A. *Nature, Lond.* April 20, 1946, p. 500.

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TABLE I—RESULTS OF URETHANE THERAPY IN MYELOID LEUKÆMIA

Case no.	Age (yr.)	Sex	Blood-counts: Initial Hb %	Initial Total white cells per c.mm.	Initial Polymorphs %	Initial Myelocytes %	Initial Myeloblasts %	After 2 months Hb %	After 2 months Total white cells per c.mm.	After 2 months Polymorphs %	After 2 months Myelocytes %	After 2 months Myeloblasts %	After mean interval 6 months Hb %	After mean interval 6 months Total white cells per c.mm.	After mean interval 6 months Polymorphs %	After mean interval 6 months Myelocytes %	After mean interval 6 months Myeloblasts %	Total amount of urethane given (g./days)	X-ray therapy	Blood-transfusion	Final result
1	22	M	48	345,000 (fig. 1)	48·5	38	4	62	5000	82	2	—	76	56,000	70	22	1·5	72/24	No	No	A
2	46	F	62	420,000	53·5	32	3	72	2300	50	(d)	(d)	87	7500	50	(d)	(d)	75/26	No	No	A
3	11	F	40	821,000 (fig. 2)	39·5	50·5	2·5	74	92,000	59	32	—	88	32,500	80	9	—	325/109	No	Yes	A
4	46	F	50	327,000	26·5	51·5	5·5	78	8500	77	3	—	72	124,000	56	19	8	173/35	No	No	B
5*	50	M	68	18,000	19	14·5	7·5	..	..	..	..	..	..	..	..	..	..	320/24	No	No	C
6*	30	M	43	51,800	—	76	13·5	..	..	..	..	..	..	..	..	..	..	63/19	No	Yes	C
7	45	M	44	335,000	37·5	48	7·5	60	6200	59	12	—	42	182,000	..	...	..	122/50	No	No	B
8	57	M	60	220,500	54	34·5	2	84	4800	79	1	—	98	38,000	81	11	—	138/28	No	No	A
9	61	F	58	190,000	58	37·5	1	63	4200	83	(d)	(d)	70	11,100	84	(d)	(d)	132/34	Yes	No	A
10	53	F	40	246,000	48·5	44·5	1·5	40	5400	82	(d)	(d)	38	61,000	75	19	1	71/26	No	No	B
11	50	F	52	680,000 (fig. 3)	50	31·5	0·5	80	4800	70	5	—	100	18,200	96	(d)	(d)	119/40	No	No	A
12	18	M	61	159,400	19	67·5	6·5	70	19,000	37	46	5	64	12,800	66	21	—	93/31	Yes	No	A
13*	16	M	50	868,000	—	—	98	..	..	..	..	..	..	..	..	..	..	84/28	No	No	C
14	59	M	52	404,000	..	..	..	60	3900‡	60	(d)	(d)	90	33,000‡	71	18	—	63/18	Yes	No	A
15	49	M	82	72,000	50·5	39·5	4	78	25,200	84	6	—	..	..	..	..	..	139/27	Yes	No	B
16	60	F	46	257,000	52	36	2·5	60	7100‡	..	..	..	52	91,500‡	69	24	3	26/9	Yes	No	B
17	57	F	72	303,000	56	38	2	72	8350‡	82	10	—	69	3400‡	36	(d)	(d)	172/34	Yes	No	A
18	55	F	41	457,000 (fig. 4)	26	63·8	3·2	76	15,000	48	33	—	..	..	..	..	..	108/28	Yes	No	C
19	26	M	88	111,000 (fig. 5)	—	32	—	98	9800	73	6	—	88	9800	93	2	—	93/24	Yes	No	A

TABLE II—RESULTS OF URETHANE THERAPY IN LYMPHATIC LEUKÆMIA

						Lymc	Lymb				Lymc	Lymb				Lymc	Lymb				
20*	6	M	22	62,300	0·5	14	80	..	..	..	..	..	..	..	..	..	..	8/9	No	Yes	C
21*	8	M	34	200,400 (fig. 9)	0·4	6	93	..	..	..	..	..	..	..	..	..	..	80/42	No	Yes	C
22	48	F	62	721,200 (fig. 10)	2	97	0·5	90	6600	60	33	—	52	93,600	5	95	—	51/17	No	No	C
23†	3	M	34	1800	18	48	33	88	9600	45	45	6	..	..	..	..	..	56/56	No	Yes	C
24	68	M	50	31,700	5·5	94	—	50	17,800	..	..	..	..	..	..	..	..	92/20	Yes	No	B
25	57	M	84	55,000	13	83	3	90	10,400	24	73	—	88	12,800	23	74	—	144/25	No	No	A
26	68	M	82	37,800	8	92	—	84	24,800	10	90	—	90	31,500	..	..	..	44/11	No	No	A
27	59	M	60	754,000	0·5	99·5	—	76	83,500	..	..	..	32	74,500	..	..	..	390/63	No	No	B
28	60	F	78	78,200	7	88	3	66	25,000	3	96	1	70	22,800	23	76	—	70/60	No	No	B
29	42	F	46	466,000 (fig. 11)	2	96	2	38	232,000	3	86	(a)	90	11,400	44	41	(d)	243/31	Yes	No	A
30	67	F	44	1,359,000	(b)	..	...	84	28,800‡	14	34	(c)	88	16,500‡	..	..	..	36/11	Yes	No	A
31	51	F	72	60,400	8	91	1	74	6400‡	50	45	(d)	91	8000‡	44	54	(d)	40/5	Yes	No	A
32	48	M	48	110,500	1	99	—	30	44,100‡	4	94	—	42	6000‡	47	45	—	88/22	Yes	Yes	B

* Died within 2 months. † Died before October, 1945. ‡ Blood-count related to X-ray therapy.
A, considerably improved; B, improved but unsatisfactory; C, died.
(a) immature cells 11 %; (b) immature cells almost 100 %; (c) immature cells 54 %; (d) no immature cells.
In table II the figures in the columns headed "Lymc" refer to lymphocytes and those in the columns headed "Lymb" refer to lymphoblasts.

Urethane alone was used in 9 cases; 4 patients received X-ray therapy after a trial of urethane, and 1 of these (case 29) was again transferred to urethane treatment at a later stage with good response. Of the 13 cases, 2 did not respond to urethane, given over eleven days in case 30, and over five days in case 31. Case 30 had previously been treated with isopropylphenylcarbamate without responding, and in case 31 urethane was discontinued because of nausea. In 2 further cases X-ray therapy was instituted later because the response to urethane was considered inadequate.

On the whole it may be said that the response to urethane in lymphatic leukæmia is less good and more variable than in myeloid leukæmia. Variation is greater not only in the dose required but also in the time necessary for an adequate reduction in the white-cell count. For lymphatic leukæmia the lowest dose given was 8 g., which lowered the total white-cell count from 48,000 to 7000 in nine days. At the other extreme, 360 g. in another case had not reduced a white-cell count of 750,000 to normal limits after sixty-three days.

Cases Treated with Urethane only.—The following remarks are based on the findings in 11 cases: 9 treated exclusively with urethane, and 2 treated later with

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X rays but in which the response to urethane could be studied (cases 29 and 32).

The time taken for the count to fall to about 20,000 varied between nine and forty-seven days, averaging nineteen days, in a calculation which excludes 1 aleukæmic case, 1 (case 29) which did not attain this level in 153 days and received X-ray therapy also, and

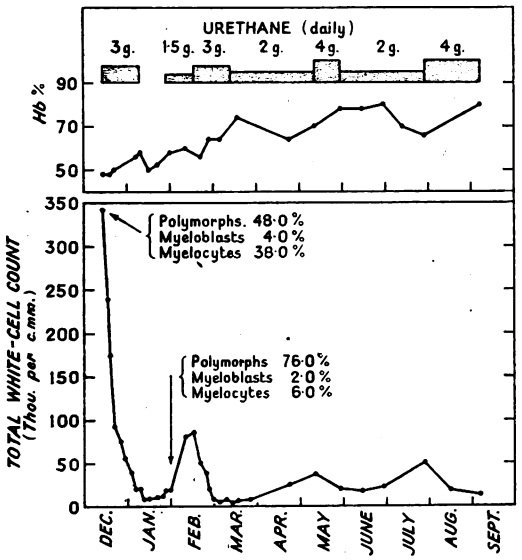

Fig. 1—Myeloid leukæmia: chart of case 1.

1 (case 27) in which the count had not reached 20,000 within three months. The total white-cell count fell in all except the aleukæmic case, in which it rose. The same was true of the lymphocyte count, which fell on an average to 22% of the original figure. The least fall (case 20) was to 48%, and here the original figure was low. The greatest fall was to 0·9% of the original (704,000). The amount of reduction was roughly proportional to the size of the pre-treatment lymphocyte count. Lymphoblasts were present in 5 cases before treatment; in 4 of these the blast cells disappeared, and in 1 (case 20) the blast-cell count was reduced to 5% of the original figure but quickly increased again on cessation of treatment. The absolute number of polymorphs fell in 5 cases and rose in 4. Where the initial absolute count was less than 2000 per c.mm., the number rose after treatment. The ratio of polymorphs to cells of the lymphocyte series rose in all cases save one, in which it remained stationary.

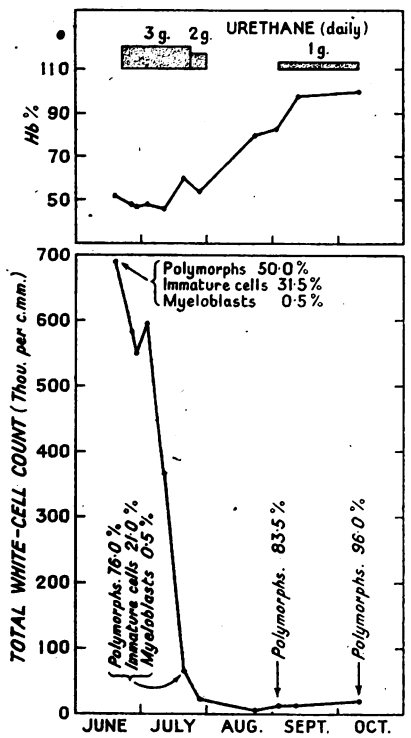

Fig. 3—Myeloid leukæmia: chart of case 11.

The hæmoglobin level rose in 7 of the 11 cases, the mean rise being 22%; 3 of these patients had blood-transfusions during the period studied. In 4 cases the hæmoglobin value fell by a mean amount of 9%. The initial hæmoglobin level was seen to be an important factor in prognosis. In 6 patients the hæmoglobin levels were 55% or higher; of these 5 are alive. In 4 patients the hæmoglobin level was below 55%; of these 3 are now dead. All 4 of these patients were given blood-transfusions, in 3 with temporary good effect; the fourth showed no benefit from blood-transfusion but is still alive and in fair condition.

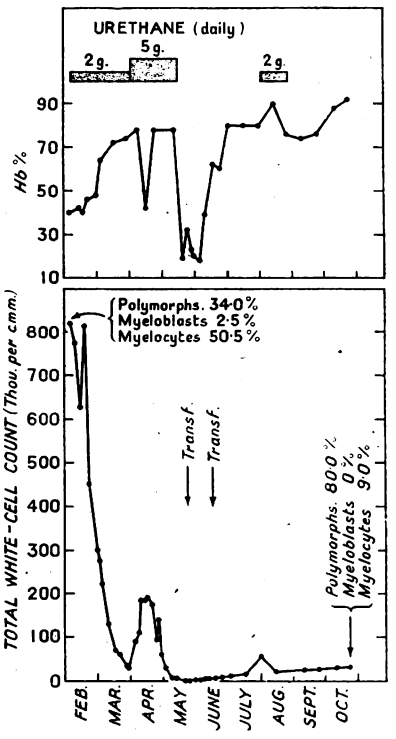

Fig. 2—Myeloid leukæmia: chart of case 3.

An immediate improvement in general condition was evident in 8 cases, blood-transfusion contributing to this improvement in 3. Enlarged lymph-nodes decreased in size (fig. 13), but in no case did they disappear. In 1 patient with diabetes (case 28) there was no improvement in general condition. Of the 11 patients 5 are alive, 3 being well, 1 in a stationary condition, and 1 now deteriorating after a remission of two and a half months; 6 have died.

Cases Treated with Urethane and X-ray Therapy.—To 2 patients (cases 30 and 31) treatment with X rays was given after a short and unsuccessful trial of urethane;

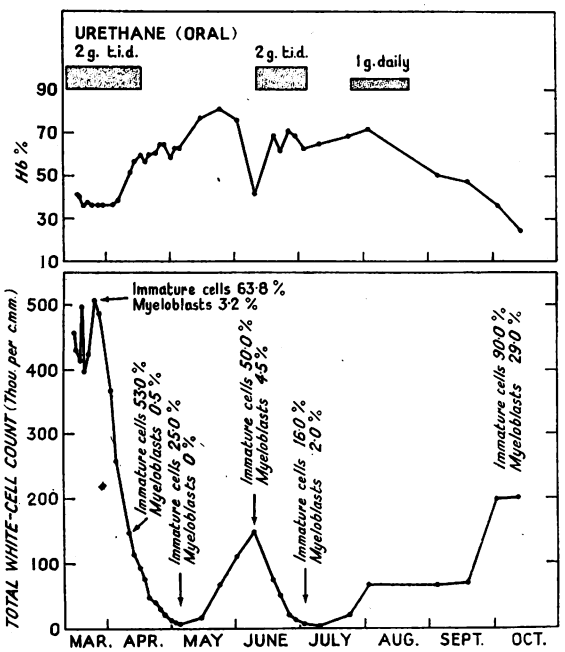

Fig. 4—Myeloid leukæmia: chart of case 18.

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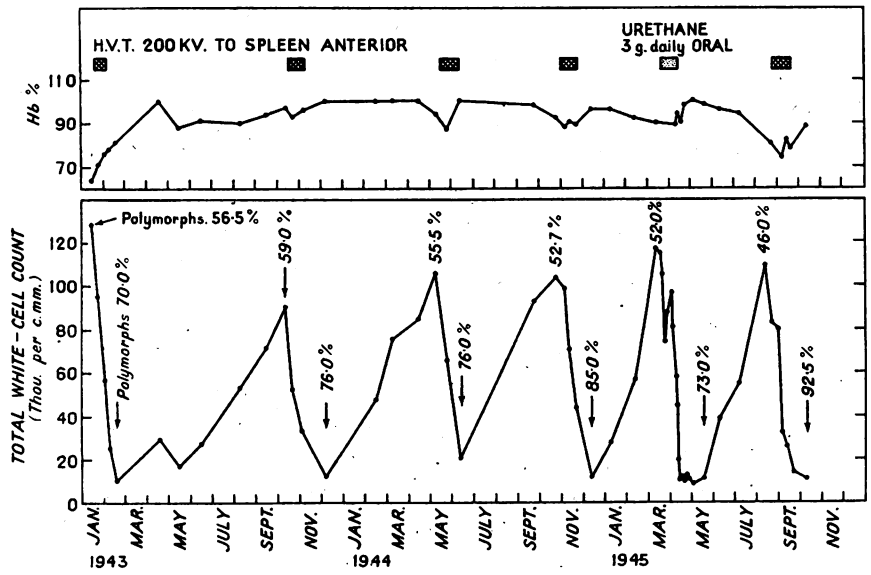

Fig. 5—Myeloid leukæmia: chart of case 19.

both are well seven and a half and five months after treatment. To 2 others X-ray therapy was given later because the response to urethane was not considered adequate; 1 of these (case 29) had first been treated with isopropylphenylcarbamate, which reduced the white-cell count only moderately. A further moderate decline followed treatment with urethane, but X-ray therapy was substituted as the response was unsatisfactory. The rate of fall remained very slow, the white-cell count being 38,000 after two months' X-ray therapy; this may possibly be explained by alteration of technique consequent on previous splenectomy. Urethane was again given, and two months later the white-cell count reached 11,000 with a hæmoglobin value of 90%. The patient is at present very well eight months from the start of treatment. Case 32 was treated satisfactorily with urethane, but three months later the white-cell count had risen to 50,000 and the hæmoglobin level was falling. Transfusion did not produce any betterment, but incomplete X-ray therapy brought about a real if slow improvement, the polymorph ratio rising from 13% to 40% and hæmoglobin increasing by 18%. This patient is in fair condition four and a half months from the start of treatment.

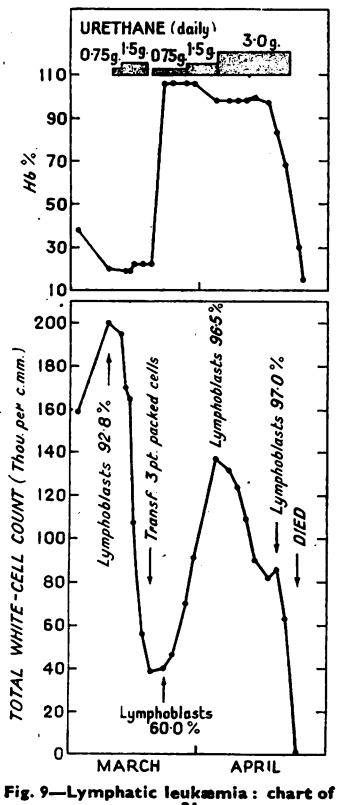

Fig. 9—Lymphatic leukæmia: chart of case 21.

Side Reactions.—No side-effects were observed in 4 cases, but 9 showed anorexia, nausea, or vomiting, and 1 had diarrhœa. In only 1 (case 31) was nausea sufficiently severe to necessitate the withdrawal of urethane.

EFFECT OF OTHER SIGNIFICANT TREATMENT ON THE RESPONSE OF MYELOID AND LYMPHATIC LEUKÆMIA TO URETHANE

Previous X-ray therapy did not interfere with the later effectiveness of urethane, as was seen in cases 9, 15, and 16 (myeloid) and 24 (lymphatic). There is a possibility that the administration of urethane enhanced the effect of subsequent radiotherapy; certainly the reaction to X rays was dramatic in all such cases except case 29, in which an unduly slow response was probably due to the technique adopted.

Previous treatment with isopropylphenylcarbamate is thought to have impaired the reaction to urethane in all the cases in which it was used—15 and 16 (myeloid) and 29 and 30 (lymphatic)—but case 29 later responded satisfactorily to urethane after a remission had been obtained with X rays.

LEUKÆMIA TREATED WITH X RAYS

Myeloid Type.—A contrast group was studied consisting of 31 cases treated by deep X-ray therapy. These were treated at one centre (Christie Hospital) between 1940 and 1944 and excluded 4 cases followed for less than one month; 19 were male and 12 female, and all were chronic.

In 30 cases treatment was applied to the spleen. Two types of treatment were used, either 200–500r a week over a period of months or 100–200r a day for short periods not exceeding three weeks. Many cases had repeated courses of treatment of either type at later stages of the disease.

For the present comparison of the effect on the blood and on the general condition the same criteria have been applied. The blood-count before treatment was compared with that taken when the white cells reached a figure of 20,000 per c.mm. The mean time for this to

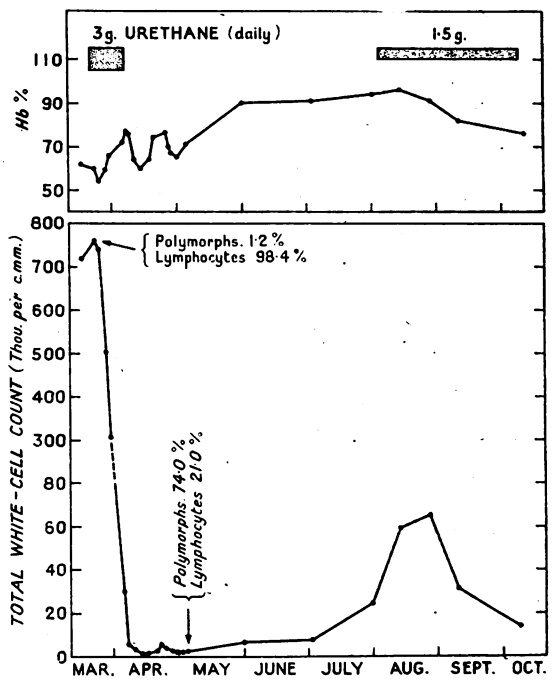

Fig. 10—Lymphatic leukæmia: chart of case 22.

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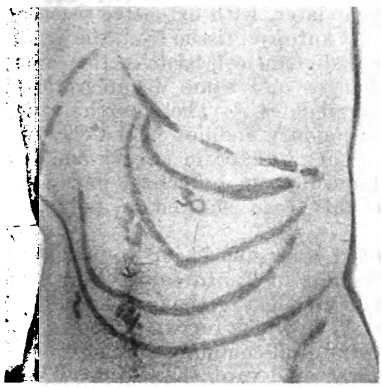


Fig. 6—Splenic outline on May 2, 14, 23, and 30, 1945 (case 6).

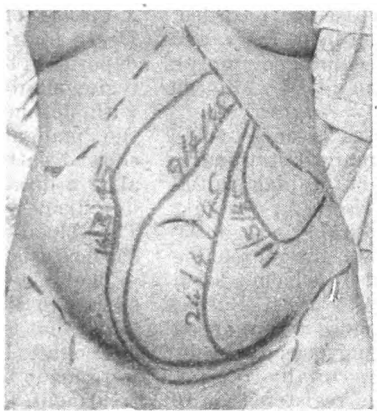


Fig. 8—Splenic outline on March 16, April 4 and 24, and May 11, 1945 (case 18).

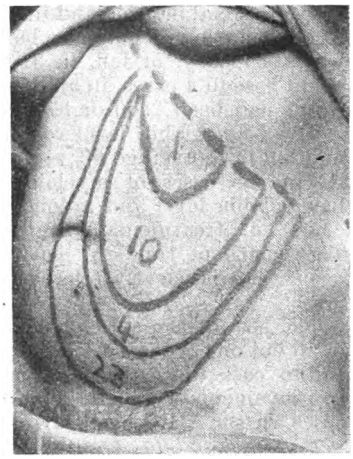
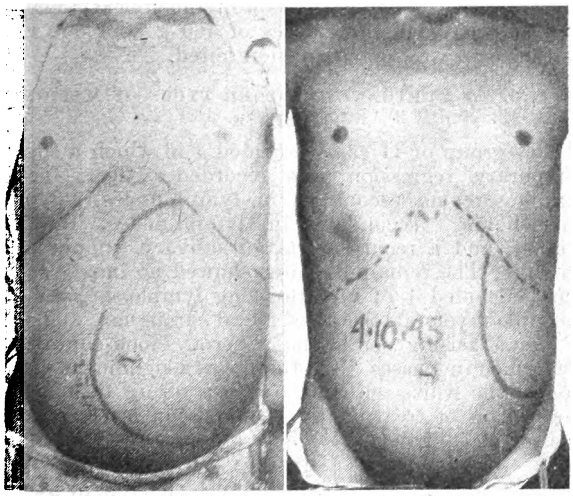


Fig. 12—Splenic outline on March 23, April 4 and 10, and May 1, 1945 (case 22).

take place was thirty days, the extremes being nine days and a hundred days. Differential blood-counts showed that the greatest percentage decrease in cells occurred in myeloblasts, promyelocytes, myelocytes, and metamyelocytes, in that order, with the adult polymorphs as the most resistant. The persistence of myeloblasts or of promyelocytes indicated a worse prognosis.



(a) (b)

Fig. 7—Splenic outline (a) on July 2, 1945; (b) on Oct. 4, 1945 (case 12).

In 29 cases there was a rise in hæmoglobin, the mean increase being 17%. In 1 case the level remained stationary, and in 1 it fell slightly. Although a high initial hæmoglobin level indicated a favourable prognosis, the degree of rise after the first course of treatment was of greater importance. The mean life of patients whose hæmoglobin rose over 15% in this period was almost twice that of those whose hæmoglobin level rose 15% or less. General condition improved in 29 cases, in some instances very much. In all cases diminution was observed in the size of the spleen. Side reactions to X-ray therapy were not recorded in all cases; 9 of the 31 patients were noted as having symptoms due to treatment, such as malaise, vomiting, or diarrhœa, and 3 had local symptoms of discomfort or pain over the splenic area.

Lymphatic Type.—For comparison with the series treated with urethane an examination was made of the response to deep X-ray therapy of 14 cases of lymphatic leukæmia treated at one centre (Christie Hospital) between 1940 and 1944. The series included 12 males and 2 females; 6 patients who died within a month, or were not followed, have been omitted. All cases but one were chronic. Of the 14 patients 12 are dead.

The standard treatment was radiation applied to the spleen and in most cases also to enlarged lymph-nodes. Some patients had a short intensive course of 4–10 days' treatment (at the rate of 100–200r daily), repeated later when required; others had serial treatments of about 250r at intervals of a week or more.

A comparison was made of the blood-count before treatment with the count when it first fell to about 20,000 white cells per c.mm. The median time taken to reach this level (used because of wide spread and irregular response) was nineteen days, and extremes were six days and twenty-two weeks, excluding 2 cases which did not respond to this extent. The lymphocyte count fell in 12 cases, the drop being greatest where the initial lymphocyte count was highest. The time involved was, however, apparently independent of the initial height of the count and of the dosage used. Lymphoblasts were present in the peripheral blood in 5 cases: in 3

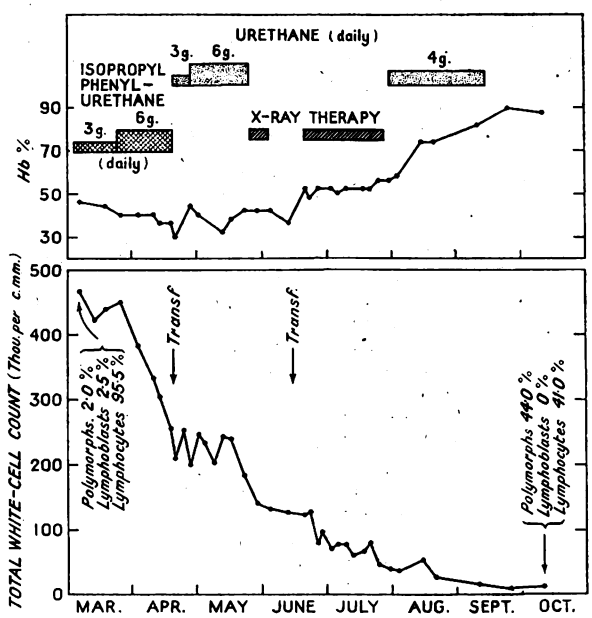


Fig. 11—Lymphatic leukæmia: chart of case 29.

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they disappeared; in 1 the blast-cell count fell to 30% of the original figure; and in 1 an increase was recorded. The proportion of polymorphs increased in 10 cases, and was stationary, or fell, in 3. The absolute polymorph count rose in 4 cases, in all of which the initial white-cell count had been 2200 or less.

The hæmoglobin level rose in 7 cases (average 16%) and fell in 5 (average 6%); in 2 it remained stationary. As in the cases of myeloid leukæmia, a high initial hæmoglobin level and a considerable rise after the first course of treatment indicate a favourable prognosis. The length of time the patient remains in reasonable health can be clearly related to the rise in hæmoglobin level.

The size of the spleen and lymph-nodes was reduced in all but one of the cases where enlargement was present. In no case did enlarged lymph-nodes totally regress. Improvement in general condition was registered in 10 cases, in some not until several months had elapsed.

Comparison with Urethane.—The effects of urethane and of deep X-ray therapy are strikingly similar, both in the type of changes in the differential count and in

(a) (b)

Fig. 13—Contour of neck and enlarged lymph-nodes (a) on May 22, 1945; (b) on July 5, 1945 (case 25).

the length of time required for the response. The rise in hæmoglobin level after urethane treatment is also similar to that following radiotherapy. No statement can yet be made comparing the length of life of patients treated by the two methods.

The chronic myeloid type responds very well both to urethane and to X rays. Of the lymphatic type, whereas the effects on the blood are similar in both methods of treatment, there were too few uncomplicated cases to warrant a comparison of the palliative effects of urethane with those of X-ray treatment. In acute leukæmia, whether lymphatic or myeloid, there is an undoubted response to urethane, but the results are as disappointing as in X-ray therapy.

EFFECT OF URETHANE IN CARCINOMA OF THE BREAST AND ON THE NORMAL BLOOD-COUNT

Urethane was given to 13 patients with advanced carcinoma of the breast. Only 3, or possibly 4, showed changes attributable to treatment. One of these showed reduction in the size of a recurrent mass on the chest wall after the administration of 142 g. of urethane in five and a half weeks. A month later, jaundice supervened and deposits were found in the liver. The drug was then stopped. The mass increased and death took place from abdominal metastases. A second patient had responded well for two years to the synthetic œstrogen triphenylchloroethylene, but response was failing and new lesions had appeared. After 148 g. of urethane had been given in six weeks, a malignant ulcer measuring 7 × 5 sq. cm. epithelised, and previously enlarged supraclavicular nodes were no longer palpable. Urethane treatment was continued for five months and was stopped because of intermittent nausea. A year later the patient remains in good general condition, although lesions are advancing. The third case showed epithelisation of a recurrent ulcerated mass in the chest wall after a dosage of 184 g. of urethane in twenty-four days. Death took place a year later, with extensive secondary deposits in the liver. At autopsy, tissue from the axillary region showed viable malignant-cell islets in the corium, with degenerative changes and some disintegration of the malignant-cell aggregates. The fourth patient showed flattening of secondary nodules on the chest wall after a dosage of 96 g. of urethane in twenty-one days, but died, within a month, from influenzal pneumonia. The blood-count in this case showed a polymorph leucocytosis.

The side-effects noted were nausea or vomiting in 3 cases and slight drowsiness in 2. In some cases it was found that urethane had an effect on the peripheral white-cell count. In 6 of the 11 in which repeated blood-counts were made the total white-cell count was reduced during treatment. In 5 this was moderate, the white-cell count being reduced to 40–70% of the pre-treatment figure and returning to normal on cessation of treatment. In 1 case with regression of the tumour mass the white-cell count fell from 7800 to 1200 per c.mm.; within eight days of the withdrawal of urethane the count had risen again to 2670. The cells of the polymorph series were most affected, whereas hæmoglobin and red-cell count were unchanged. It was this finding which suggested the trial of urethane in leukæmia.

Another 2 patients with advanced carcinoma of the breast were treated with isopropylphenylcarbamate for two months with total doses of 460 g. and 800 g. In neither case was any regression noted.

EFFECT OF URETHANE IN OTHER TYPES OF MALIGNANT DISEASE

This group of 11 cases included 4 in which a slight or temporary regression was recorded; these included lymphosarcoma secondary in lymph-nodes, "lympho-epithelioma" secondary in lymph-nodes, Hodgkin's disease, and a recurrent mixed salivary tumour of the antrum. The remaining cases showed no improvement; these included 1 of metastasising lymphosarcoma, 2 of multiple myelomatosis, 3 of rectal carcinoma, and 1 case of metastasising seminoma. Serial blood-counts were performed in 4 cases. In 3 there was a significant diminution in the white-cell count, with a return to normal on completion of treatment. Hæmoglobin levels remained unaltered.

SUMMARY

Urethane (ethylcarbamate) has been used in 32 cases of leukæmia (19 myeloid and 13 lymphatic) observed over periods ranging between eleven months and five weeks. The effects produced—represented in the most favourable cases by a fall in total white-cell count to normal limits, a tendency for the differential count to approach a more normal pattern, diminution in the size of the spleen and enlarged lymph-nodes, and a rise in hæmoglobin level—are remarkably similar to those obtained by standard methods of deep X-ray therapy, with which they are compared.

There is no indication that permanent benefit may result from the use of urethane in either myeloid or lymphatic leukæmia; for relapses take place and immature cells may reappear in the blood. The cases are too recent to enable any statement to be made about effect of treatment on length of life. It can, however, be said that the palliative effect is in many cases very great.

Urethane has also been administered in 13 cases of advanced carcinoma of the breast and in 11 cases of other types of malignant disease. A moderate leucopenia was observed in 9 of these. In 3 of the breast cases and 4 of the miscellaneous group there was a temporary diminution in the size of lesions.

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RAPID CHEMICAL DISINFECTION OF CLEAN UNWASHED SKIN

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IN spite of seventy years of investigations it is still very difficult to give any clear account of the chemicals and their concentrations that will disinfect the skin under any particular set of practical conditions. This is largely due to the great complexity of what might appear a simple problem. For example, the hands and fingers present a problem different from that of simple skin surfaces, and the methods and materials suitable for leisurely disinfection of skin areas before operations are not necessarily the same as those needed for very quick disinfection before needle-puncture or surgical incisions in emergencies.

"The skin" may be taken to mean either the surface of the skin alone, or the surface and the depth together, while "disinfection" may be interpreted either as complete sterilisation or as adequate though incomplete elimination of bacteria.

The skin as a complex tissue of considerable thickness cannot be chemically sterilised without destroying it. The transient bacteria (Price 1938) on the surface at any moment can, however, be destroyed by several chemicals, though after a time some of the resident bacteria (Price 1938) may emerge from below, probably in and among the epithelial scales, and recontaminate the surface. These, however, are generally harmless commensals and will give no trouble when carried deeper into the tissues by a hypodermic needle or the surgeon's knife. Pathogenic bacteria on the skin are generally transient, though some species, especially *Staph. aureus* and *Strep. pyogenes*, occasionally become temporary residents, and their removal by chemicals may be impracticable. Skin carriers of *Staph. aureus* are a special problem which cannot be dealt with here.

There is an extensive literature on this subject (Kolle and Wassermann 1931, Colebrook 1941, *British Medical Journal* 1944) which it is not proposed to review.

The main object of this work has been to attack a limited part of the problem by applying a simple, reproducible, and roughly quantitative method to ascertain what solutions will "virtually disinfect" an unwashed artificially contaminated simple flat skin surface in a very short time (15 sec.–5 min.). By "virtual disinfection" is meant the destruction of at least 99·9% of the organisms on the surface of the skin, excluding spores.

DR. EDITH PATERSON AND OTHERS

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METHOD

A standard measured area of skin is moistened with a suspension of a normal skin commensal, *Staph. (epidermidis) albus*, containing a standard number of cocci per c.cm. This is allowed to dry, and then the area is moistened with the disinfectant. After the allotted time a sterile wet swab is rubbed all over the area, and with this a plating is made on nutrient agar.

Skin Area.—By using the anterior surface of the left forearm a person can carry out the test on himself. The hairs are cut or shaved off, and a number of areas are marked out by pressing some circular object, such as the cap of a screw-cap bottle, on the skin and marking the circumference with a grease pencil. The standard area is about 24 mm. in diameter, and up to 12 or 14 of these can be treated in one experiment.

Bacterial Suspension.—From an 18–24 hr. agar culture of an epidermal white coccus a suspension is made in water to equal Brown's No. 1 tube in opacity. In this a small sterile wool swab (about 5 mm. in diameter) is dipped and the area is carefully moistened all over with the suspension, leaving no excess and not overstepping the circumference. After 1–1½ min. the area should be visibly dry.

Application of Disinfectant.—With another small swab the disinfecting solution is applied to the area in just the same way, so as to moisten it uniformly all over, without flooding or leaving excess. The area thus treated should extend slightly beyond the marked circumference.

Time.—The minimal time taken for alcoholic solutions to dry on the skin is 15–20 sec., and most aqueous solutions take 1–1½ min. Certain substances, such as 'Dettol' (undiluted or in strong emulsion) may need as much as 5 min. Most of the experiments have been done either (1) by testing directly the area has dried (15 sec., 1½ min., &c.) or (2) by leaving for a total of 5 min. from the application. In some cases—e.g., ethyl alcohol (see table 1)—the superior results of the longer period indicate that the action continues after the skin appears dry, but in other cases (pot. permang. and acriflavine in 70% alcohol) the extra "dry" time did not improve the result.

Swabbing and Plating.—A small swab is moistened with nutrient broth, excess fluid is squeezed out by pressure against the inside of the broth-tube or bottle, and the swab is carefully rubbed all over the area, being turned over and over in the process and avoiding contact with skin outside the area. The swab is then immediately streaked all over the surface of a plate of nutrient heart-extract agar, the operator turning the swab over and over during the process.

Water Control.—The suspension of cocci is applied to one or two standard areas and allowed to dry. The area is then swabbed with sterile water instead of disinfectant. When the water is dry, the usual swab is taken for a plating, which after incubation should show a very dense, even semi-confluent, colonisation. The swabbing with water is necessary to imitate the application of the disinfectant swab, which itself must remove large numbers of microbes.

Bacteriostatic Control.—If the disinfectant under test has a high bacteriostatic titre—i.e., prevents growth overnight in broth at a high dilution—a control must be set up to ensure that a bacteriostatic dose of disinfectant is not transferred by the swab from the skin area to the surface of the agar. For this purpose an area not treated with cocci is moistened with the disinfectant and after drying is swabbed on to agar in the usual way. A small loopful of the coccal suspension is then spread on the agar plate. If profuse growth takes place, the control is satisfactory; but, if inhibition is evident, the main test is vitiated (see below).

Assessment of Results.—The platings are incubated overnight and, if there is little or no growth, for a second

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night. By inspection, and, where desirable by counting the colonies, records are made of "virtual disinfection," partial disinfection, or absence of action. The term "virtual disinfection" is used because it has not been found feasible to restrict the designation "disinfection" to absolutely sterile platings. In a method like this, which involves exposure of skin surface swabs and agar surface to the air, occasional contaminating colonies are bound to appear on the plates, besides those of sporing bacilli from the skin, which the disinfectant will not have eliminated. Therefore, unless more than five colonies similar to those of the test coccus develop on the plate, the result is recorded as "virtual disinfection"—always assuming that the yield of colonies from the water control runs into at least several thousand.

It is clear that the normal cocci of the skin also play a part in this test, but their numbers are so small compared with the multitude of those applied to the area that their rôle may be regarded as negligible.

It should be realised that nearly all the substances tested caused a great reduction in the cocci recoverable from the treated area, but since the aim was to achieve virtually complete disinfection, all counts of more than six coccal colonies have been recorded as failures.

The advantages of using a non-pathogenic staphylococcus are obvious. A preliminary examination of the first coccus so used showed that it had the same degree of resistance to phenol and 'Zephyran' as *Staph. pyogenes aureus*, which is known to be at least as resistant as *Strep. pyogenes* to disinfectants in general. The use of *Ps. pyocyanea* in certain experiments is described below.

EFFICACY OF VARIOUS DISINFECTANTS

Iodine.—Table I shows that the only solution that gave virtual disinfection with great regularity in 15–20 sec. was 2% iodine in 70% alcohol, the virtues of which are well known and have been upheld by many investigators—e.g., Hatfield and Lockwood (1943). Experiments not included in table I have shown that *Ps. pyocyanea* is cleared from the skin by alcoholic iodine as quickly and effectively as the staphylococcus (10 of 10 areas contaminated with *Ps. pyocyanea* were completely disinfected). This then is the ideal disinfectant for needle puncture, when great rapidity is essential. It seems that for surgical incisions also a single painting just before the operation is all that is necessary, and that elaborate washings and other preparation of the skin could be omitted, for we know that no amount of washing removes all the "resident" bacteria (Price 1938).

Aqueous iodine at 0·5–2% was not quite so uniformly successful in 1½ min. as alcoholic iodine in 15 sec.; but a very slight prolongation of action would presumably make it regularly effective.

Ethyl alcohol alone has a strong bactericidal action, but it seldom achieves virtual disinfection in 15 sec. The results were improved if the plating swabs were taken 5 min. (¼ min. wet+4¾ min. dry) after the application, but even here from one in ten to one in four of the tests were unsuccessful. There was no demonstrable difference between 97% and 70% alcohol. In some additional tests the number of the cocci applied to the skin was reduced to 1/10 or 1/100 of the standard number. In both cases all of three areas were virtually disinfected by 97% alcohol in 5 min. (¼ min. wet + 4¾ min. dry). There seems little doubt that a more prolonged application of alcohol, and indeed of most or all of the disinfectants listed in table I, would disinfect even heavily contaminated skin.

The addition to alcohol of acriflavine 1 in 1000 did not improve the action of alcohol alone. This is easy to understand, as the flavines are not rapid powerful disinfectants but slow benign germicides especially suitable for wound antisepsis. Acriflavine in alcohol has been used in hospitals as a skin disinfectant either on its own supposed merits or as a substitute for unobtainable iodine, but it is clearly no substitute; the figures even suggest that it may impede the action of the alcohol.

Again, the addition of 1% HCl did not improve 70% alcohol. Only 15 sec. was allowed in these tests, and it may be that the acid would exert an additional effect if more time were allowed. With a very different and prolonged technique Meyer and Vicher (1943) found 0·5% HCl in water a good skin disinfectant.

Chlorine, in the form of 'Chloros,' which appears to be the equivalent of a 10–12% solution of chlorine, was disappointing, since neither undiluted nor at 1 in 2 to 1 in 8 did it give satisfactory results with any regularity in the 1½ min. which was needed for drying on the skin.

'*Dettol*,' which takes 5 min. to dry when used undiluted, was also unsuccessful in about half the trials. Dilution made the results even worse. Here also some prolongation of exposure to the disinfectant would almost certainly succeed, but that point was not pursued.

The detergents, 'CTAB' ('Cetavlon') and zephyran, needed special treatment for the following reason. They have the property of high "bacteriostatic" selectivity—i.e., whereas they both prevent the growth of *Staph. aureus* in broth up to a dilution of 100,000 or more, the concentration needed for *Ps. pyocyanea* is about 1 in 200. To a smaller degree they are also selective in simple bactericidal tests on suspensions of bacteria in water. Thus CTAB kills *Staph. aureus* (20 mill. per c.cm.) in 5 min. at 1 in 16,000, whereas the lethal dilution for *Ps. pyocyanea* is 1 in 4000. Zephyran shows less selectivity in the bactericidal test, the respective lethal concentrations being 1 in 3000 and 1 in 2000. The exceptionally strong, slow, and selective "bacteriostatic" action on cocci vitiates the standard skin test when high concentrations of these substances are used; for, when solutions 1 in 1 to 1 in 8 of zephyran and 1 in 20 to 1 in 80 of CTAB are applied to the skin, enough is transferred by the swab from the skin to the agar to inhibit growth, and it is therefore impossible to say whether the cocci on the skin have or have not been killed. At dilutions higher than those mentioned neither CTAB nor zephyran adequately disinfects the skin.

To overcome this difficulty *Ps. pyocyanea* was used in a series of tests, which showed that CTAB at 1 in 20 or more did not cause virtual disinfection in 1½ min. Two strains were used, because *Ps. pyocyanea* is a highly variable organism. A strain recently isolated from urine, giving smooth colonies, resisted disinfection by dilutions of 1 in 20—i.e., the strongest possible—1 in 40, and 1 in 80; and the reduction in the number of colonies recovered, compared with the control, was only slight. The result with an old stock culture which gave rough colonies was better, though even 1 in 20 did not quite cause virtual disinfection, three tested areas yielding respectively 18, 7, and 3 colonies of the skin coccus; 1 in 40 was less effective, though one area of three was disinfected (yields: 0, 28, 29 colonies); and 1 in 80 was still less effective, with 21, 43, and 200 colonies. Since 2% iodine in 70% alcohol kills this microbe on the skin in 20 sec., one must conclude that CTAB is less effective than alcoholic iodine as a rapid disinfectant.

The results with zephyran indicated that its action is rather stronger (or quicker) than that of CTAB, perhaps because it is a true solution, whereas CTAB at 1 in 20 is more of a suspension. Thus zephyran at 1 in 1 and 1 in 4 virtually disinfected in 1½ min. all of three areas previously treated with the old "rough" *Ps. pyocyanea* and all of three treated with the new "smooth" strain. Since in bactericidal tests staphylococci are more sensitive than pseudomonas to zephyran we can safely assume that 1 in 4 (and possibly 1 in 8) will rid the skin of staphylococci. We can therefore class zephyran as a rapid skin disinfectant, though less rapid

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and convenient than alcoholic iodine, since it takes 1½ min. instead of 15 sec. to dry.

The only other chemical substance tried with the skin test was *potassium permanganate* at 1 in 20, which, as table I shows, was generally ineffective in 1 min. exposure.

TABLE I—RAPID DISINFECTION OF UNWASHED SKIN BY SINGLE APPLICATIONS OF DISINFECTANT

Disinfectant	Time of action (min.)	Tests	Virtually disinfected	Remarks (*Staph. (epidermidis) albus* used unless otherwise stated)
Chloros 100 %	1½	9	2	Dries in 1½ min.
Dettol 100 %	5	12	6	Dries in 5 min.
Pot. permanganate 5 %	1	9	2	..
	1 (+4)†	9	0	..
Ethyl alcohol 97 % ..	½	5	0	Dries in ½ min.
Ethyl alcohol 70 % ..	½	25	5	..
Ethyl alcohol 97 % ..	½ (+4½)	20	15	..
Ethyl alcohol 70 % ..	½ (+4½)	15	13	..
Acriflavine 1/1000 in 70 % alcohol	½	21	5	..
	½ (+4½)	11	5	..
HCl 1 % in 70 % alcohol	½	25	3	..
Iodine 2 % in 70 % alcohol	½	45	45	..
Iodine 2 %*	1½	20	18	Dries in 1–1½ min.
Iodine 1 %*	1½ (+3½)	2	2	..
Iodine 0·5 %*	1½ (+3½)	2	2	..
Iodine 0·25 %* ..	1½ (+3½)	2	0	..
Zephyran 100 % ..	1½	6	6	*Ps. pyocyanea* used
Zephyran 25 % ..	1½	6	6	*Ps. pyocyanea* used
CTAB (cetavlon) 5 %	1½	4	1	..
CTAB (cetavlon) 2·5 %	1½	5	1	..

* In aqueous potassium iodide.
† Figures in parentheses signify the time after the disinfectant had dried on the skin and before the swab sample was taken.

EXPERIMENTS IN COLLABORATION WITH PROF. H. J. SEDDON

Before the foregoing method was worked out, an attempt had been made to assess the efficiency of CTAB and iodine for preoperative skin disinfection—i.e., elimination of the natural surface flora—by the excision and cultivation of small strips of previously disinfected skin from the edges of the wound at the beginning and end of the operations, which varied in length from half an hour to more than two hours. In the preoperative preparation of the skin the disinfectant was applied twice: once on the day before the operation, the area being then covered with sterile dressings, and again just before the operation.

The excised strips of skin, 2–3 cm. long and a few mm. wide, were immediately dropped into screw-capped bottles containing 10 c.cm. of sterile heart-extract peptone broth, which were incubated at 27° C for twenty-four hours. If no growth took place, incubation was continued for two more days. To exclude the possibility of "bacteriostatic" action of traces of disinfectant carried into the culture medium on the skin, strips which had not produced growth in forty-eight hours were transferred into other bottles of broth. In these, however, delayed growth did not take place any oftener than in primary cultures subjected to an equivalent total length of incubation. It may be objected, with much truth, that the term "bacteriostatic action" really means a slow bactericidal action, and that this type of control test was illusory, as the cocci, if any had been present, might have been slowly killed by the traces of disinfectant carried over into the first broth. But, since more than half of the first cultures, which might contain such traces of disinfectant, gave growths of cocci, sometimes early and profuse, the quantity of disinfectant carried over was shown in many instances to be insufficient to prevent growth.

Since, according to the accepted view (Price 1938), the skin has a resident population of bacteria, some of which live below the surface, it seemed likely that some might escape the action of disinfectant applied to the surface, and that a complete destruction of all cocci on the strips could not always be expected. And, since plating-out methods were inapplicable and a single live coccus could initiate growth in the broth, the best method of assessment seemed the statistical method—the testing of sufficient strips with every solution to find what proportion were completely or virtually disinfected.

An additional difficulty arose from the sporadic presence on the skin of spores of bacilli, which withstood the disinfectant and gave rise to growth in the broth. Every culture was therefore examined microscopically and, if necessary, by subcultivation to determine the nature of the growth; and, if it was exclusively bacillary, the skin was deemed to have been virtually disinfected, in the sense of being freed from its normal population of cocci.

A good proportion of the positive cultures, both of cocci and of rods, took more than twenty-four hours' incubation to develop, which indicated that very few bacterial cells had survived the treatment.

Results are shown in table II. The figures should be interpreted thus:

With 2% aqueous iodine (for example) 29 skin samples were taken at the beginning, and 28 at the end of operations, making a total of 57 samples. Out of every 10 of the "beginning" samples 3·8 were sterile, while 5·9, though not all sterile, showed no development of cocci in the cultures. This means that 5·9 − 3·8 = 2·1 per ten showed a growth of rods only. The elimination of cocci almost certainly involves also the elimination of vegetative rods, and this is all one could hope to achieve, spores being too resistant to be killed by any solution the skin will tolerate. The total figure for "no cocci" in the iodine section—i.e., 5·8—may well represent about the highest proportion of successes that this method could give with any feasible surface disinfectant, and the degree to which it falls short of 10 per 10—i.e., 4·2 per 10—represents the proportion in which either some deep-seated cocci escaped destruction or a few cocci were introduced as a contamination during the handling and plating-out of the materials. It is probable that the former cause was more frequent than the latter.

TABLE II—CULTIVATION OF SKIN-STRIPS EXCISED AT OPERATIONS (RESULTS EXPRESSED AS PROPORTIONS PER TEN TESTS)

Disinfectant	Iodine 2 % (aqueous)			CTAB 5 %			CTAB 1 %		
Time of excision ..	Beg.	End	Total	Beg.	End	Total	Beg.	End	Total
Number of tests	29	28	57	21	17	38	8	8	16
CULTIVATION RESULTS (PER TEN)									
No growth of any bacteria ..	3·8	4·6	4·2	3·8	2·4	3·1	1·2	0·0	0·6
No growth of cocci	5·9	5·7	5·8	3·8	2·9	3·4	2·5	2·5	2·5

Beg. = beginning.

Table II shows three things: (1) that 2% aqueous iodine gave considerably better results than 5% CTAB; (2) that 5% CTAB was considerably better than 1%; and (3) that the results at the end of the operation are almost as good as those at the beginning. With iodine there is certainly no significant difference, which confirms Colebrook's (1941) view that iodine has a much more persistent action than is often supposed.

It is therefore in the comparison of different solutions rather than in the demonstration of their absolute disinfecting power that this method gave the most useful results; and to obtain more absolute information it was found necessary to develop the method described earlier in this paper.

SUMMARY

A description is given of a standardisable technique for measuring the skin-disinfecting power of chemicals, and of its application in the rapid preparation of unwashed skin for needle-puncture or surgical incision.

Virtual disinfection was achieved in 15–20 sec. with a single application of 2% iodine in 70% alcohol.

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In 1½ min. zephyran was effective, but none of the other disinfectants tested were completely successful in that time.

An account is given of some earlier experiments done in collaboration with Prof. H. J. Seddon by the method of skin-strip excision, in which aqueous iodine proved superior to CTAB.

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BLOOD-TRANSFUSION IN INDIAN FAMINE

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FAMINE, severe and widespread, threatens India this summer; and, though preparations to meet it are being made with all possible determination, those of us who have experienced Indian famine know what a colossal task it will be to rescue even a small proportion of its destined victims.

The starving Indian has usually never received an adequately balanced diet or been free from the debilitating effects of chronic infestations by intestinal parasites and protozoa. Most of the people live in the small villages where medical attention is very primitive. Hence, when proper medical aid is sought, the patient usually is already grossly emaciated, dehydrated, and barely conscious, and either is unable to swallow or can only swallow a few sips of water. The chronicity of the emaciation is often revealed by the ulceration of bony points through the skin. Often the spleen is enlarged (the regions most susceptible to famine are those where malaria and amœbic colitis are endemic) and despite his almost complete inertia the patient has a temperature of 102°–104° F. He almost invariably has a mucous diarrhœa with frequent small motions, sometimes blood-streaked, and vegetative forms of *E. histolytica* are found in the stools of about half the cases. These patients are profoundly anæmic, hæmoglobin values in the region of 3 g. per 100 c.cm. being common.

It is not surprising that when such people are brought long distances by rough road transport many will die within a few hours of admission to hospital.

At necropsy the gut wall is sometimes so thin that print can be read through it, and often to the naked eye does not appear to possess any mucosa at all. This is especially so with the small bowel, while the large gut is as a rule lined by shallow confluent ulcers with paper-thin mucosa between them.

Blood-transfusion is the only therapy that can influence the condition of these patients quickly enough to save their lives. The dangers of transfusion in the profoundly and chronically anæmic Indian are perhaps even greater than in chronically anæmic Europeans, since the Indian's vital reserves are drained by a multiplicity of simultaneously acting factors. However, the urgency of the condition and the failure of many Indian anæmias to respond to iron and liver therapy have led workers in the East to attempt blood-transfusion in various ways.

The usual method has been multiple small intravenous injections of whole blood, but this leaves much to be desired. In dealing with a similar problem among troops, I used a method of administering blood at a rate many times slower than had previously been used, and I found that, provided the rate was sufficiently slow, blood could be administered without danger. This method was later used in cases of famine among Bengali civilians, again without untoward effects, and permitting large volumes of blood to be administered.

My guiding principles were modified from those of Marriott and Kekwick,[1] who laid down the following rules for blood-transfusion in the relief of profound anæmia:

(1) Never exceed a rate of 1 c.cm., per lb. of body-weight per hour.
(2) If the hæmoglobin value is less than 25%, or if there is cachexia or cardiac or respiratory disease, never exceed 0·5 c.cm. per lb. of body-weight per hour.
(3) Maintain the determined rate steadily and never accelerate for short periods.
(4) Watch carefully for heart-failure, dyspnœa, râles, or cough; if such signs appear, stop the transfusion.

These principles do not provide for the type of patient, often seen in an Indian famine, who has concurrently a hæmoglobin of 25% or often much less, cachexia, an active infection, and a chronic infestation or multiple infestations. For such patients I regard the optimal transfusion-rate as lower than 0·5 c.cm. per lb. of body-weight per hour, and used as a usual rate 0·25 c.cm. The difficulty was to find an apparatus capable of delivering blood at this rate. Young adult men in a famine-stricken Indian community commonly have a body-weight of about 5 st.; hence the drip must be extremely slow.

> A man weighing 5 st. 10 lb. (80 lb.), with 3·2 g. of Hb per 100 c.cm., continuous fever of about 100° F, and diarrhœa for many months, received without reaction five bottles of blood (more than 2 litres). The first was given at the rate of 0·25 c.cm. per lb. of body-weight per hour—i.e., he received the blood at the rate of six drops a minute.

I do not know of any apparatus that can deliver blood regularly and reliably for many hours at six drops a minute. Intravenous needles or cannulæ eventually become blocked when the flow of citrated blood through them is very slow. I therefore tried diluting the blood with isotonic saline so that I could give a mixture containing the right amount of blood per minute. I tried diluting whole blood and diluting red-cell concentrates. This was an improvement on previous methods, but ultimately I adopted a method in which the dilution factor was under constant control, so that it could be varied with the patient's clinical condition, and the blood-cells were in contact with the diluting medium for a minimal period.

The principle of this method was that, provided the saline-diluting medium was administered slowly enough for the body to eliminate it as fast as it was given, the rate of administration of retained fluid was simply the rate of administration of the blood in the mixture, which could be made slow enough for acceptance even by these grossly anæmic and debilitated cases.

In the coming famine any method adopted must employ apparatus already existing in quantity.

TRANSFUSION TECHNIQUE

Apparatus.—An ordinary Y-piece set with blood on one side and saline on the other, with one drop-counter below the Y-piece, and an adjustable tube clip between each bottle and the Y-piece.

Method.—The drip began with saline at 20 drops a minute (a very slow rate but one easily achieved with ordinary equipment). This was continued for ten minutes to permit any venous spasm to relax, and the rate was then readjusted to 20 drops a minute of saline, if necessary. If after another five minutes the rate was unchanged, the blood tube was opened so that the rate of combined flow became 26 or 24 a minute, to give 6 or 4 drops of blood a minute, or whatever rate was desired. Little adjustment was thereafter required, but in any

1. Marriott, H. L., Kekwick, A. *Brit. med. J.* 1940, 1, 1043.

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event adjustment is very easy. I found that from ordinary glass drop-counters blood, or isotonic saline, or isotonic glucose-saline, or any mixtures of them, fell at the rate of 18–20 drops per c.cm. at room temperatures. We adopted the policy of regarding 18 drops as 1 c.cm.

It took several days for a patient to receive an adequate transfusion, and therefore the comfort of the method was important, as was the avoidance of thrombosis in the recipient vein. Accordingly the needle or cannula was introduced into a vein in the middle of the forearm on the radial border and not into the antecubital region. No splint was used, and a fair range of movement was permitted in the recipient limb, the wrist being very loosely hobbled to the edge of the bed. It is of especial importance so to place the needle that the patient's forearm can lie comfortably in pronation. For a long infusion the internal saphenous vein was inferior to the radial antebrachial vein, as the former was far more likely to become painful on the third day.

It became customary to give blood for two days and then, after a day's rest, for another two days into another vein, and so on, with needles and not cannulæ. This not only gave the patient's system an additional opportunity to adapt itself to the receipt of blood but also reduced the incidence of phlebitis. Indian famine strikes in the hot weather as a rule, when skins are sweaty and flies abound, and in such circumstances phlebitis is likely to develop, unless one is very careful.

Should a nursing sister become concerned about the patient and wonder whether he is suffering from excessive or unsuitable blood administration, she simply closes the clip on the blood tube and then seeks the doctor, who can as easily switch it on again if he thinks fit. The saline continues harmlessly to drip at 20 drops a minute. This becomes very important in an overloaded hospital during the night, when a doctor may not be able to come immediately he is summoned. It is very distressing to find a transfusion unnecessarily stopped and the cannula withdrawn; and tragic to find it unwisely continued.

It is good practice to maintain a fluid-balance chart in these cases during the transfusion, and, when circumstances permit, for a few days beforehand. It should be carried out carefully and a reasonable allowance made for loss through the skin, the respiratory system, and the bowel.

OBSERVATIONS

In the blood-saline mixture the red cells were of normal appearance and there was no rouleaux formation. The mixture had a sedimentation-rate identical with that of the citrated blood, and these findings were unchanged when the same samples were re-examined after being kept overnight in the refrigerator. The improvement observed clinically and hæmatologically indicated that the cells administered were effective erythrocytes. This is a tribute to the accuracy of preparation of the isotonic saline which came from Army medical stores.

It is important to realise the great difference between the values of fresh and stored blood in this work. Fresh blood should, if at all possible, always be used. Stored blood has its value, but it can be relied on only for about three days. After that time, though still of value in the treatment of acute hæmorrhage, it is better not used in anæmia. Blood a week old sometimes seems to produce a deterioration in the patient's condition. For this reason red-cell concentrates were dropped.

Reaction to Slightly Excessive Rate.—Some patients receive a drip transfusion with equanimity, whereas others exhibit anxiety and are ill at ease. At first I assumed that this variation merely revealed the patient's temperament and education, but in time I learnt that restlessness and anxiety can be an indication of a slightly excessive rate of blood-transfusion and can be eliminated by slowing the flow from, say, 10 drops a minute to 6. Though no other sign of excessive rate may be observed, slowing it usually has an almost immediate effect, so that the patient once more takes an interest in his meals and sleep becomes possible.

Type of Case Treated.—The very slow transfusion was adopted primarily as a "last hope" treatment for the almost moribund, but it was so reliable that I came to use it in all starvation cases with a hæmoglobin value of less than 50%.

Stage 1 in the treatment of the severe cases is that in which immediate danger of death is combated. Stage 2 is that in which nourishment has to be forced on a patient with almost complete anorexia. It is in this stage that the drip feeding by Ryle tube, as used by Lieut.-Colonel G. Ransome, R.A.M.C.,[2] is of such value. Stage 3 is that in which the patient who has recovered a little appetite is treated principally by the dietetic regime of the sister-in-charge, who restores him gradually to normality.

Transfusion finds its value in stages 1 and 2. During a famine many patients when first seen are in stage 3, but still the numbers in stages 1 and 2 are so great that giving blood is a whole-time job for a medical officer. Therefore this method can only succeed if properly organised as a special department in the hospital. If it is used as an occasional method by a doctor busy with other things, it is unlikely to be properly managed.

Contra-indications.—The contra-indications are simply those to an intravenous isotonic saline drip at 20 drops a minute—namely, fluid retention and pulmonary œdema. I have often given this treatment to people with râles in their chests or œdema in the legs, and even with an apex-beat to the left of the nipple line. The danger being one of overloading with fluid, there is no danger if the renal elimination of fluid is efficient, since it can then cope readily with much greater rates of administration than used in this treatment. In a word the only real contra-indication is inability to eliminate fluid and salt.

When there was any clinical indication, and when life was not in immediate danger, the patient was put for three days on a carefully kept fluid-balance chart, urinary chlorides being estimated. I did not have any occasion to withhold the treatment and very few occasions even to delay it. Nearly all these patients can eliminate fluid and salt efficiently.

Results.—After tragic experience of treatment without the use of transfusion and disappointing experience with other methods, I found in this routine a safe, effective, and reliable form of treatment. There were no cases of circulatory overloading, and many remarkable recoveries from an almost moribund condition. Used in the patients who were very anæmic but whose lives were not in immediate danger, the treatment was my most effective therapeutic instrument. Supplies of blood were not always easily secured, especially fresh blood, but the average number of 500 c.cm. bottles of citrated blood given per patient was four, and some had as many as twenty. I relied on blood to raise the hæmoglobin value above 60% and then usually stopped it, partly because of the difficulty in obtaining supplies but also because it was a satisfactory routine.

A striking feature was that even in most serious cases deterioration was usually arrested when the transfusion began, however slowly.

The total number of severely anæmic patients treated by transfusion given in this manner, after the final routine had been established, was 109 with hæmoglobin values below 30%, most of them below 25%. Of these 8 died: 1 of an incompatible transfusion due to an error of grouping technique; 4, who were grossly emaciated and moribund, within 48 hours of admission without even temporary improvement; and 3 during

2. Ransome, G., Gupta, L. M., Paterson, J. C. S. *Ibid*, 1944, ii, 594.

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the fourth week of treatment. Necropsy showed the typical thinning of the gut wall, with extensive destruction of the mucosa of the colon and severe secondary infection of the colon wall.

The great majority of the remainder were not followed beyond the point at which they became fit to travel. They then had hæmoglobin values of 60% or more, had lost their fever and diarrhœa, recovered an appetite for food, and put on a good deal of weight. Areas of skin ulceration were either healed, if small, or granulating. Patients who had been seriously ill were amnesic for that period.

It is to be hoped that, when a similar clinical task is next undertaken in an Indian famine, adequate laboratory facilities will be at hand to enable the maximal information to be obtained from the opportunity.

SUMMARY

Indian famine is a special problem, because the patients are usually already the victims of several debilitating pathological processes. They are often profoundly anæmic and do not respond well or quickly to liver and iron therapy.

Mortality is very high among these very anæmic patients, unless something can be done quickly to improve the condition of their blood.

Blood-transfusion, notoriously risky in anæmic people is especially so among these debilitated famine victims. It does, however, offer the only method of saving many whose condition cannot otherwise be controlled.

It follows that a safe technique for the administration of blood was required, and a technique was adopted which was both effective and safe. It employs ordinary apparatus, is only a little more complex than ordinary methods of transfusion, and is very easy to manage when assembled.

Details in the practical management are described, as they are essential to success.

Grateful acknowledgment is made to Dr. J. M. Smellie, late consulting physician to Eastern Command, India, for his interest and support, and to Drs. E. A. Wood and T. N. S. Kurup for their collaboration in the use of the method.

SERUM PHOSPHATASE IN LATHYRISM

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ALTHOUGH lathyrism is an extremely disabling disease and is fairly common in certain parts of the world, particularly India, its ætiology, apart from its association with a diet restricted to vetch-peas (*dal*), is still unknown. Several theories have been advanced—Acton (1922) cited by Young (1927), Anderson et al. (1925), Mellanby (1930), Geiger et al. (1933), Shah (1939)—but all of them lack a convincing experimental background. According to Jiménez Díaz et al. (1943) the vetches contain a toxic substance which antagonises some thermostable water-soluble substance, distinct from the known vitamins, which is present in certain foodstuffs. Lathyrism, they maintain, is due to massive doses of lathyrus peas and lack, particularly, of foodstuffs of animal origin which furnish the protective element.

In view of the intimate relationship between vitamin B_1 and the nervous system, it is surprising that the state of vitamin-B_1 nutrition in lathyrism cases has not been investigated so far, as lathyrism is the result of the degeneration of part of the nervous system. We have made a comprehensive survey of the state of vitamin-B_1 nutrition of lathyrism patients. It was soon evident that the diets of some of the patients were balanced and the vitamin-B_1 contents of their blood and urine were of an order which might be regarded as lying within normal limits. It was thought that, though there might not be an apparent vitamin-B_1 deficiency, there might be a physiological one due to an unknown factor. We decided to determine the serum-phosphatase levels of lathyrism patients.

The serum phosphatase was determined by the method of Bodansky (1937). No magnesium ions were added, as the native phosphatase value was of importance and no activation was desirable. The values for normal subjects and lathyrism cases are given in the accompanying table, which shows that serum phosphatase in lathyrism is consistently and considerably higher than that in normal persons. Out of the 10 cases investigated in not a single case does the serum phosphatase lie even on the borderline, and the minimal value is 228% higher than the maximum value in normal persons. The result is statistically significant. The possibility of such values occurring by chance is less than 1 in 370.

SERUM PHOSPHATASE IN NORMAL SUBJECTS AND LATHYRISM CASES (ALL ARE MALES)

Serial no.	Normal subjects		Lathyrism cases	
	Age (years)	Phosphatase (units)	Age (years)	Phosphatase (units)
1	22	2·3	20	38·0
2	50	2·7	18	53·5
3	24	1·0	40	56·5
4	40	5·7	35	42·5
5	30	2·4	20	35·6
6	20	2·2	24	33·0
7	35	2·6	21	36·0
8	22	2·7	16	33·5
9	20	3·4	45	18·7
10	27	0·8	30	39·6
11	35	1·1	..	..
12	23	2·7	..	..
Mean	..	2·38	..	38·7
Median	26	..	23	..

It seems to us possible that the greatly increased alkaline phosphatase which we have demonstrated in the serum in lathyrism may possibly destroy the circulating cocarboxylase. If this is so, the patient may be chemically saturated with aneurine but still functionally deficient in vitamin B_1. As a natural sequence to this state the nervous system may possibly degenerate.

We suggest that the high serum phosphatase and a consequent possible cocarboxylase deficiency in lathyrism are related to the ætiology of the disease. We do not attempt to explain how or why the serum phosphate rises in lathyrism. It is also possible that the high serum phosphatase is the effect, and not the cause, of lathyrism. It may be mentioned here that the inorganic-phosphate content of serum in lathyrism is unusually high. Usually the serum-phosphatase level is a measure of the severity of the disease.

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IN the *Times* of April 11 it was announced that Mr. John Hunter and Prof. Bryan McSwiney have arrived at Kingston, Jamaica, as representatives of the University of London to consider plans for setting up a medical school as part of the proposed University of the West Indies. The new university would be associated with the University of London, and several of the West Indian governments have already accepted in principle the proposals for its establishment in Jamaica.

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RAPID DEATH FOLLOWING INJECTION OF ANTITETANIC SERUM

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ON Nov. 19, 1945, a strong healthy well-built boy, aged 15, a pupil at an agricultural training-school, crushed the last joint of his left index finger in a plough. He received immediate first-aid and was driven to the local hospital. A doctor was summoned by telephone and attended, but ordered 3000 units of antitetanic serum to be given at once before his arrival. This was injected into the pectoral muscle just below the right clavicle. A small quantity was injected at first; and then, as there appeared to be no reaction, the rest of the dose was given without removing the needle.

Almost immediately the boy complained of feeling ill. in ten minutes he was vomiting, and very soon collapsed. He had increasing respiratory difficulty, with cyanosis, and this deepened till his death, which took place an hour after the onset of symptoms. On the initial collapse an injection of 'Coramine' was given, followed by 10 minims of adrenaline intramuscularly. Artificial respiration was maintained with oxygen, and when the heart stopped, 10 minims of adrenaline was injected into the heart. Later the abdomen was opened and the heart massaged, after a further 10 minims of adrenaline had been injected into it.

Necropsy Findings.—Organs healthy. Face, upper chest, and arms cyanosed; and deep and widespread postmortem staining, rising high on each flank. Scalp œdematous; skull dark red from deep cyanotic congestion of diploë. Large surface veins of brain full, and small vessels in pia mater and on section of brain congested. Cortex a pale mulberry colour.

On mediastinum, surface of pericardium, surface of heart, costal pleura, and thymus were innumerable hæmorrhages, from mere pin-points to 5 mm. across. Lungs (15 oz. each) aerated, not very deeply congested or œdematous, but posteriorly lower lobes and much of upper lobes covered with almost continuous sheet of subpleural hæmorrhage. Intense cyanotic congestion and œdema of pharynx and glottis, which must have materially contributed to death from asphyxia.

Great veins of neck and right chambers of heart distended with dark fluid blood, and large subendocardial hæmorrhages on septum.

Mucosa of stomach and intestines only slightly congested and pale pink, but mucosa of duodenum more deeply congested, with some submucous hæmorrhages.

Liver (44 oz.) and kidneys not deeply congested; spleen (4 oz.) pale.

I failed to find the site of the injection till the doctor pointed to an almost imperceptible mark below the right clavicle. There was no urticaria round this minute puncture and no œdema along the track of the needle, which had been directed upwards, nor was any seen in the muscle at the presumed end of the track. From these observations and the rapid onset of symptoms it is probable that the point of the needle had entered a vein, into which the injection was made.

My thanks are due to Mr. Wills Taylor, H.M. coroner for West Surrey, for permission to publish this case.

Medical Societies

TUBERCULOSIS ASSOCIATION

AT a meeting in London on March 15, with Dr. NORMAN TATTERSALL, the president, in the chair, a discussion on the

Changing Chest Clinic

was opened by Dr. PHILIP ELLMAN. The hospital surveys, he said, had revealed glaring deficiencies in the tuberculosis service in some parts of the country, and these could best be remedied by a wider conception of the service's functions and by greater integration with other branches of medicine, especially diseases of the chest. Recent figures showed that only 18% of the patients attending his clinic were tuberculous; the term "chest clinic" was more apt than "tuberculosis dispensary." Preferably the clinic should be a general hospital department while remaining the pivot of the tuberculosis service; it should in fact be the outpatient department of the whole chest service, of which the chest unit and the sanatorium constituted the inpatient departments. Such an arrangement would ensure suitable disposal for patients with non-tuberculous chest disease, and would facilitate special treatment for tuberculous subjects with superadded lesions, such as diabetes. A section of beds in the chest unit and sanatorium would be allocated to thoracic surgery. Mass radiography would be closely linked to the clinics. The social service department, responsible for the functions of almoner and health visitor, would be the link between the service and the patient's home, and would have preventive and restorative duties. The physician in charge of the department would have to be fundamentally a general physician, but with more specialist training than was now demanded by the Ministry of Health, and with interest in social and preventive medicine.

Dr. F. RIDEHALGH recalled that the late R. C. Wingfield, himself a sanatorium physician, always emphasised that only the tuberculosis officer saw the whole picture of the tuberculosis problem. To the medical officer of health the disease was a study in epidemiology; the consulting physician concentrated on the clinical problem; but the tuberculosis officer, though conversant with the epidemiological and clinical aspects, was above all interested in his patients. Tuberculosis had two outstanding characteristics. First, it constituted a vicious circle—the disease produced poverty, and poverty predisposed to the disease. Secondly, the treatment was "not medicine but a mode of life." Thus the everyday problems of the tuberculous family became the everyday problems of the tuberculosis officer, and the unique doctor-patient relationship thus evolved was the cement between the bricks of a good service. The tuberculosis officer could give the lie direct to those who argued that, under State control, medicine must lose its soul. He was clinician, administrator, epidemiologist, and economist. It seemed logical that he, with his broad outlook, should command the battle against tuberculosis. To do this he must preserve his perspective and his identity. He was, or should be, a chest diagnostician of the first order; the argument that he should treat non-tuberculous chest conditions was attractive, but there was real danger that by concentrating on clinical aspects he might lose his perspective and neglect his main duty which was the eradication of all forms of tuberculosis. He should emphatically not become simply the head of a chest clinic; the constant help of other specialists would always be needed, and the tuberculosis officer should continue to handle all forms of the disease. The assimilation of tuberculosis into the general hospital, though it had obvious advantages, also carried the risk that the service might lose its autonomy, which should at all costs be retained.

Dr. BRIAN THOMPSON drew attention to the lack of continuity in treatment; when the patient was admitted to a sanatorium, neither the physician there nor the tuberculosis officer followed the condition throughout its course.

Dr. E. K. PRITCHARD considered that the service envisaged by Dr. Ellman was too comprehensive; non-pulmonary tuberculosis was usually seen by tuberculosis officers only after it had been diagnosed.

Dr. C. K. CULLEN said that the tuberculosis service interlocked with all the other health services of the country. Further association with hospitals would ease diagnosis, but would not help in the epidemiological field.

Dr. A. F. BLAGG left £105,169, the residue of which, subject to a life interest, is to pass to University College Hospital Medical School.

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Reviews of Books

A Manual of Tuberculosis

(3rd ed.) E. ASHWORTH UNDERWOOD, M.A., B.SC., M.D., D.P.M., M.O.H. and chief administrative T.O. for West Ham. Edinburgh: E. & S. Livingstone. Pp. 512. 15*s*.

Dr. Underwood's book has been extensively revised with a view to emphasising three unities—the unity of this pleomorphic disease; the unity of team spirit needed between patient, physician, nurse, tuberculosis officer, and local authority for the treatment of the disease and the prevention of its spread; and the unity of the patient, demanding the recognition and treatment of the patient as a whole and not merely as the accidental possessor of diseased organs to be attacked. It is an ambitious project, and the work is not without its shortcomings. But there is far more in it to be praised highly than there is to be found wanting. Much of the material has never been expounded hitherto in any English textbook; and many topics, mentioned only perfunctorily by most authors, here receive detailed and careful consideration. The chapters on the principles of sanatorium treatment, showing how these principles should be put into effect in the management of the patient before, during, and after his residence in a sanatorium, could scarcely be bettered. A chapter on mental aspects is the most lucid that has appeared so far in any textbook. The last five deal with the work of the tuberculosis dispensary, administrative measures, epidemiology, and social and environmental factors (including the effects of war on the disease) and succeed in endowing these subjects with a living interest.

The faults are rather errors of omission and imbalance than of inaccuracy or heterodoxy. A highly detailed account is given of the induction of an artificial pneumothorax; but the fundamental principles are not discussed, nor is there any word about the possibility that an A.P. should ever be abandoned as ineffective and dangerous. Pneumoperitoneum is dismissed in 7 lines, whereas 4½ pages are devoted to the preparation and use of plaster bandages. The teleological explanation that pleural effusion arises as a "pain preventer" between inflamed sensitive surfaces does not accord with the fact that separation of the inflamed surfaces by air, while relieving the pain, does not prevent the effusion, nor with the fact that pleural effusions occur far more commonly in A.P. cases than in others. Surely, also, Dr. Underwood is wrong to maintain (by implication) that more air is forced through a bronchopleural fistula into the pleural cavity during *expiration*, when the intrapleural negative pressure is lower than in inspiration?

A glossary of technical terms is appended for the benefit of nurses and lay workers responsible for the administration of tuberculosis schemes.

Textbook of Public Health

(11th ed.) W. M. FRAZER, O.B.E., M.D., M.O.H. for Liverpool; C. O. STALLYBRASS, M.D., deputy M.O.H. for Liverpool. Edinburgh: E. & S. Livingstone. Pp. 571. 25*s*.

Preventive Medicine

MARK F. BOYD, M.D., M.S., field staff member, International Health Division, Rockefeller Foundation. Philadelphia and London: W. B. Saunders. Pp. 588. 27*s*. 6*d*.

Two new editions of well-known textbooks, much alike in size and price, display different aspects of the same subject.

"Hope and Stallybrass" has long been a favourite with medical graduates seeking special health diplomas and degrees. This 11th edition, now called "Frazer and Stallybrass," keeps the general scheme but has been largely rewritten and brought up to date. "The work covers the ground both for the Certificate and the Diploma in Public Health under the General Medical Council's new rules." This it does admirably, assuming that the student has a good knowledge of the strictly medical part of preventive medicine. It is less suitable as a guide to practice: thus it gives much more space to building construction than to food-poisoning, which is dismissed in 1½ pages. The notes on chemotherapy and chemoprophylaxis are perhaps too brief to be useful, and the best chapters are those devoted to sanitation and administration. Bearing in mind its special object, the book is well balanced and convenient; and it has a good index.

Boyd's *Preventive Medicine* is American and written for doctors undertaking health work. As each of the States in the Union has its own laws and methods of administration and practice, no textbook can apply generally to the United States on these matters. Boyd therefore gives most of his space to the more strictly medical part of preventive medicine, which is of universal application. Particularly good are the chapters on normal food requirements and diseases due to dietary deficiencies. The section on diseases due to micro-organisms, which deals with such matters as water-supply and milk control, takes up nearly two-thirds of the volume. Though this work would not serve as an alternative to "Frazer and Stallybrass" for British students, the two together make a fine compendium of modern public-health practice—except that neither makes any mention of geriatrics, the prevention of chronic diseases apart from infections, or minor sicknesses.

Modern Anæsthetic Practice

(2nd ed.) Editors: the late Sir HUMPHRY ROLLESTON, Bt., M.D., F.R.C.P.; ALAN MONCRIEFF, M.D., F.R.C.P. London: Eyre and Spottiswoode. Pp. 150. 12*s*. 6*d*.

THE 2nd edition of this handbook for general practitioners has been completely revised and in part rewritten. As in the previous edition the reader is taken over the clinical field of anæsthesia by familiar paths. Each chapter is written by a different author, who covers his ground adequately for the general practitioner. Here and there items of doubtful value to the G.P., such as spinal analgesia for children and local analgesia in dental surgery, are included. The book can be recommended to the general practitioner or the occasional anæsthetist, who will find in it mature advice concerning safe and efficient anæsthesia.

L'acrodynie infantile

MAURICE PÉHU, correspondant de l'Académie de Médecine, médecin honoraire des Hôpitaux de Lyon; JEAN BOUCOMONT, professeur agrégé à la faculté de médecine de Montpellier. Paris: Masson et Cie. Pp. 98. Fr. 60.

THIS short monograph reviews most of the present knowledge of pink disease. Although the authors have previously published papers on the subject, it cannot be said that this particular work sheds any new light on ætiology or treatment. Admittedly they throw out the suggestion that the disease might be a human form of canine distemper, but they sum it up in the phrase "Pure et timide hypothèse, dirons nous." The same might well be said of the other theories of ætiology which they discuss, though the degree of timidity is variable. A selected bibliography is appended, which would be more useful if it included references to all the works mentioned in the text.

American Association for the Advancement of Science

Research Conference on Cancer. Editor: F. R. MOULTON. Washington, D.C.: The Association. Pp. 333.

PAPERS and discussions contributed to the 1944 conference of the A.A.A.S. are assembled in this volume. Most, but not all, of the active workers in experimental cancer research gave both summaries of published work and their results up to date, or took part in the discussions, which are fully recorded, and show a welcome freshness, frankness, and belligerency. Of the mass of detailed observations reported about half were concerned with biochemistry, including studies of enzymes in malignant and non-malignant cells, diet in relation to experimental tumour-production, and attempts at chemotherapy; about a third dealt with the virus approach, and the remainder with chemical carcinogenesis. These proportions reflect the current trend of most of the work in the United States, where the problem of cancer is coming to be regarded as a problem of growth in general rather than a special inquiry into the stimulus for a peculiar type of growth. This departure from the classical approach will be watched with interest—hopeful or sceptical according to bias.

For the research-worker enslaved in the minutiæ of his particular field, and for the newcomer to cancer research, this volume is invaluable, filling a need which the informal biennial conferences of the British Empire Cancer Campaign used to meet before the late war.

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THE LANCET

LONDON: SATURDAY, MAY 11, 1946

Consequences

IT was a week of famous victories. In the House of Commons the Government carried the second reading of the National Health Service Bill in a debate which showed that parliamentary opposition to it will not be pushed to extremes. At Tavistock Square the council of the British Medical Association secured, from the representatives of the majority of doctors in each division, remarkable unanimity in favour of amendments which, taken together, would make the Bill unworkable. Happily the MINISTER OF HEALTH showed himself conciliatory, while the Special Representative Meeting refrained from outright condemnation of his proposals as a whole. So we may still hope for agreement when the possibilities and impossibilities of amendment have been explored in detail and when the profession has come to understand that in its main features the scheme before them is a social necessity rather than a piece of party legislation.

The B.M.A. discussions illustrated once again (as Dr. H. B. MORGAN put it) the doctor's habit of looking at things through the microscope. Under a wider view the reorganisation now being attempted might be seen as a direct consequence of what happened in the economic depression of the early 'thirties. At that time, it will be remembered, millions of people all over the world, and not least in this country, spent months or years out of work, in penury and degeneration, because it was not considered profitable to employ them. Never perhaps in history had there been so many tasks demanding attention—the demolition of slums, the building of houses, schools, and hospitals, the improvement of roads and communications, the revival of the countryside, and the fuller education of both adolescents and adults. But our rulers, until they embarked on rearmament, deemed it uneconomic to spend large sums on employing the unemployed to the public advantage. The damage thus done to so many people kept on the dole because it did not "pay" to give them work was remembered in the relatively prosperous years of war, when in every barrack-room and every firewatchers' post our fellow-citizens slowly made up their mind that never again should a Government get away with the excuse that work is not available. Having observed the effects, they concluded that it is unprofitable to the nation to let its members go undernourished rather than employ their labour—or to let them remain ill rather than give them the best that modern medicine can offer. And most of those who discussed these things, in their new-found fraternity, felt not only that in time of scarcity the basic needs of food, shelter, and medical care must be met first, but also that any measures of social security provided by the community to preserve health and strength and hope ought to cover everybody alike. They wanted to continue into peace the sense of unity developed in war. When therefore Sir WILLIAM BEVERIDGE proposed that his scheme should apply to every single citizen he met a deep-seated need for an expression of solidarity. And when some of the representatives of medicine asked for exclusion of the wealthier 10% of the population they misread the spirit of the hour.

That part of the controversy is over. The 100% issue is settled, and it is agreed that so far as resources allow, everybody is to have whatever medical attention he requires, without payment apart from his contributions to insurance, rates, and taxes. The new Bill is a medical Magna Carta, declaring, so far as the service is concerned, that "to no-one will we sell, deny, or delay" the benefits of medicine; and once this object is stated much of the rest follows inevitably. If medical care is to be had free of charge by all who need it, somebody must be made responsible for seeing that in every village, town, and city it is readily obtainable by the inhabitants. The main responsibility for this might be placed (1) on an autonomous National Medical Corporation, (2) on the local authorities, or (3) on the central Government. Several years' exhaustive discussion has shown that the third of these solutions is alone practicable, but opinion still differs on the powers the central Government will need if it is to achieve the rapid rationalisation of hospital services which the recent surveys have shown to be necessary. Under the so-called Willink plan, which still has advocates, all hospitals were to be left in their present ownership, and the Ministry of Health was to improve and coördinate them through the power of its purse, on the advice of regional and area planning bodies without administrative functions. There can be no doubt that Mr. BEVAN'S decision (contrary to the policy of the Labour Party) to transfer ownership of all hospitals to the Crown will make it far easier to raise the standards of backward institutions and assign to each hospital its proper place in a regional scheme. His Bill, moreover, reintroduces the idea of administration by corporations composed of people chosen for their special suitability; for in each region a corporate body, the regional board, is to control the hospitals. Provided their constitution is sound, such boards should be well qualified to bear the responsibility for ensuring a satisfactory hospital service. The Minister accepts responsibility, but delegates it immediately to the sort of body the medical profession has often said it wanted.

Who then is to administer the rest of the medical services? Here again the only choice is between corporations, local authorities, and central Government; and here again the Bill is shaped by the facts of the situation. Greater neatness and better coördination could no doubt be attained by putting all the remedial services (hospitals, clinics, and general practice) under the care of the regional board; but this might easily overtax the strength of what is after all a new and untried institution already open to criticism from constitutional purists. "The Government are taking a very substantial risk in proposing this form of organisation even for the hospitals, which must be regionalised. To extend it to all other medical services would be politically impracticable, even if it were desirable on other grounds." [1] If this is conceded, there is no alternative but to leave to local authorities many of the medical

1. From an informative commentary on the Bill published by the *Times* on April 29 and 30.

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and ancillary duties they now perform, but the Bill concentrates these activities by allotting them to some 145 "local health authorities"—i.e., counties and county boroughs. As general practitioners, for sufficient reasons, have no wish to make their contract with either the local authorities or the Ministry of Health, the personal health service of each locality is to be entrusted to what is virtually a local corporation, the local executive council, half composed of doctors, dentists, and pharmacists. The complexity of these arrangements is itself evidence that they are designed functionally rather than politically. Once we admit that the citizen is entitled to anything as a right, we cannot escape having machinery to see that he gets it. The remarkable feature of the machinery planned for the National Health Service by this Labour Administration is that it makes so much use of the specially appointed corporation detached both from the Civil Service and from local government.

The inevitability of the changes proposed for general practice is more easily challenged. The Government, and many members of the profession, do not like the system by which young men and women have to buy their entry into practice, and they think that in a national service the list of patients who have chosen a particular doctor cannot decently be regarded as a form of property to be bought and sold. But the main ground on which abolition of the sale of practices has been advocated both by the Coalition and by the present Government is that it is incompatible with redistribution of medical resources according to need. The present tendency, as an American has put it, is for "doctors to go where folks have dough," and in order to discharge their obligations the Government seek the right to exclude new entries to areas that may be declared "over-doctored." Speakers in the debates have argued that distribution is in fact already satisfactory; or will become satisfactory when capitation fees are paid for the whole population; or could be made satisfactory by offering amenities or higher remuneration for practice in unpopular areas. If that is so, the proposed "negative direction" will seldom have to be invoked. If, however, private practice is still to be allowed to those in the service, any Government which guarantees to provide medical care wherever needed will naturally want power to prevent concentration of talent in wealthy areas—even if it only holds this power in reserve. If it thus claims the right to interfere with the process by which vacancies are now filled, by sale and purchase, it is bound in equity to compensate doctors who lose their capital when the goodwill of practices is made unsaleable. And if it prevents the new entrant from buying a footing in general practice, it must in some way support him till he has gained enough patients to support himself out of capitation fees.

The so-called (and miscalled) power of direction, the sale of practices, and the basic salary are interlocking problems: if the sale of practices is prohibited, some alternative method of filling vacancies is required; if over-doctored areas are to be closed to new entrants, the sale of practices will be prevented; and in either of these events a case can be made out for a basic salary. Nevertheless this case cannot be said to be overwhelming, and the MINISTER might do well to consider whether some other device would gain the same end. He and the B.M.A. agree that the profession is not "ripe" for a salaried service, and he intends that practitioners should depend mainly on capitation fees. A great deal of well-founded opposition would cease if he found himself able to omit salaries entirely from the remuneration of practitioners, meeting the needs of new entrants by crediting them with a minimum number of capitation fees during their first year or two of service. Compared with a basic salary, capitation fees are less easily varied in accordance with conditions of practice and seniority—a topic on which the Spens Committee is no doubt reporting. But they have no political flavour, and they are certainly more acceptable to the profession, in its present unripe state.

Ownership of the goodwill of a practice confers a degree of independence. For this the compensation required is not financial but administrative: each doctor must have the security of knowing that he can make himself heard, that his position will be respected, and that in professional matters he will be treated professionally. The amount the Bill leaves to be decided by regulations by the MINISTER has caused legitimate uneasiness because regulations can be altered when Ministers change. The more, then, the status and terms of service of the doctor are defined in the Act, the more confidently he will work under it. Modification should be possible in this direction, and we may also look for reconsideration of various other matters, including the penal provisions concerning sale of goodwill, partnerships, assistantships, the functions of the Medical Practices Committee, and the powers of local hospital management committees. In the coming weeks of discussion, in committee and outside it, the MINISTER must show himself ready to consider all reasonable objections, remembering that even OLIVER CROMWELL held that "what we . . . gain in a free way is better than thrice so much in a forced way, and will be more truly ours and our posterity's." On their side the representatives of the profession, in visiting Whitehall, should spare a thought perhaps for CHARLES I.

Homologous Serum Hepatitis

SINCE serum hepatitis was first reported in Great Britain[1] in 1937, the main questions have been: Is the disease caused by a living or dead agent; and if the former, is it related to infective hepatitis? Attempts to transmit the disease experimentally to animals were unsuccessful and no advance in knowledge was made for several years. Interest was revived in 1942 by the serious outbreaks of jaundice in Brazil[2] and among American troops[3] who had received certain batches of yellow-fever vaccine containing human serum. Hepatitis was also reported in transfused persons and in a group of soldiers at a training centre in Britain who received a pool of mumps convalescent plasma from a small number of supposedly healthy donors.[4] There was now no doubt that serum hepatitis was a distinct entity, and

1. MacNalty, A. S. *Rep. med. Offr Minist. Hlth Lond.* 1937. Propert, S. A. *Brit. med. J.* 1938, ii, 677. Findlay, G. M., MacCallum, F. O. *Trans. R. Soc. trop. Med. Hyg.* 1937, **31**, 297.
2. Fox, J. P., Manso, C., Penna, H. A., Para, M. *Amer. J. Hyg.* 1942, **36**, 68.
3. Sawyer, W. A., Meyer, K. F., Eaton, M. D., Bauer, J. H., Putnam, P., Schwentker, F. F. *Ibid*, 1944, **39**, 337.
4. Ministry of Health Memorandum, *Lancet*, 1943, i, 83.

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experimental inoculation of human volunteers was begun in England, the United States, and West Africa to determine the identity of the agent, its properties, and possible means of control.

It is now generally accepted that naturally occurring infective hepatitis is caused by a virus. The disease has been transmitted to man by oral administration of unfiltered fæces,[5 6 7 8] Seitz filtrate of fæces,[7] urine,[7] and serum,[8 9] but not by intranasal inoculation of nasopharyngeal washings and throat garglings. By contrast, homologous serum hepatitis has only been transmitted by the parenteral inoculation of serum[10 11] or the intranasal inoculation of nasopharyngeal washings.[12] Oral and nasal administration of fæces from serum-induced cases have failed to produce hepatitis.[13] The results of field observations of infection of contacts, while not ruling out the possibility that such may occur, do not support the conception of a highly infectious disease suggested by the experiments of FINDLAY and MARTIN with nasopharyngeal washings.[12] The need to use human volunteers limits the number of subjects available for reinoculation in cross-immunity experiments and consequently reduces the validity of the conclusions, but the high attack-rates obtainable with some of the inocula used have provided fairly convincing evidence. In a complete set of experiments in which two groups of 6 and 8 subjects have been inoculated and reinoculated at six-monthly intervals with the agents of homologous serum hepatitis and infective hepatitis, NEEFE and his colleagues [14] found complete immunity to the homologous disease but none to the heterologous. Similar results have been obtained in less conclusive experiments by MACCALLUM and BAUER [11] and HAVENS [15]; and MCFARLAN and CHESNEY [16] reported that of 11 people who had had infective hepatitis in childhood 8 developed jaundice when inoculated with an icterogenic pool of mumps convalescent plasma. The only experiments not in accord with these are those of OLIPHANT,[17] who failed to produce hepatitis by the subcutaneous inoculation of infective hepatitis blood from Italy into 10 people convalescent from so-called yellow-fever vaccine (serum) jaundice in the U.S.A.

Although homologous serum hepatitis has not been transmitted experimentally to animals, the observations in man suggest that in most instances it is produced by an infective agent which is not the one causing infective hepatitis. As is the case in syringe-transmitted hepatitis, there is always the possibility that in some cases the agent present in serum pools is that of infective hepatitis and that it was circulating in the blood of donors who were in the preicteric stage or suffering from a mild unrecognised subicteric infective hepatitis. Unfortunately there is still no satisfactory way of inactivating the virus in serum.

5. MacCallum, F. O., Bradley, W. H. *Ibid*, 1944, ii, 228.
6. Havens, W. P., Ward, R., Drill, V. A., Paul, J. R. *Proc. Soc. exp. Biol., N.Y.* 1944, **56**, 206.
7. Findlay, G. M., Willcox, R. R. *Lancet*, 1945, i, 212.
8. Neefe, J. R., Stokes, J. *J. Amer. med. Ass.* 1945, **128**, 1063.
9. Neefe, J. R., Stokes, J., Gellis, S. S. *Amer. J. med. Sci.* 1945, **210**, 561.
10. Oliphant, J. W., Gilliam, A. G., Larson, C. L. *Publ. Hlth Rep., Wash.* 1943, **58**, 1233.
11. MacCallum, F. O., Bauer, D. J. *Lancet*, 1944, i, 622.
12. Findlay, G. M., Martin, N. H. *Ibid*, 1943, i, 698.
13. Neefe, J. R., Stokes, J., Reinhold, J. G. *Amer. J. med. Sci.* 1945, **210**, 29.
14. Neefe, J. R., Stokes, J., Gellis, S. S. *Ibid*, 1945, **210**, 561.
15. Havens, W. H. *Proc. Soc. exp. Biol., N.Y.* 1945, **59**, 148.
16. McFarlan, A. M., Chesney, G. *Lancet*, 1944, i, 816.
17. Oliphant, J. W. *Publ. Hlth Rep., Wash.* 1944 **59**, 1614.

The Postgraduate Medical Federation

WILLINGLY or unwillingly we enter a new era in medicine. Its philosophy is in transition, wavering in its faith in the twin bases of empiricism and applied physical science that have served it for a century, and groping after a broader attitude to the study of man as a whole, healthy and sick. Its content has increased enormously, and the subdivisions of its specialism have reached the stage where knowledge grows but wisdom lingers. And in the organisation of its service to the community it is, in Britain, about to abandon laissez-faire and seek to plan itself —or be planned—in the overriding immediate interest of the "consumer." It is at this moment, and in the aftermath of war, that the University of London undertakes a new venture in postgraduate medical education, to be known as the British Postgraduate Medical Federation.[1] The present state of flux provides a great opportunity, and also many difficulties, but there can be no doubt of the immense potential value of creating in London a strong and influential postgraduate training organisation, under university auspices. It can set the standard, and shape the outlook, for the new generation of specialists both in this country and in many parts of the Empire, and it should also seek in some degree to serve Europe and the rest of the world.

The new federation is better designed for this task than was the original British Postgraduate Medical School, because it embraces the leading special hospitals in London. The prestige and experience of Queen Square, Great Ormond Street, and Moorfields are an obvious source of strength, and the present or proposed inclusion of other special hospitals will round off a comprehensive scheme. The central office in Gordon Square, as an advice and information bureau, will be invaluable to the postgraduate visitor to London, hitherto at a loss to know where to look for what he wants and where to expect a welcome. It will also be useful to members of the federation, for it will be in a position to estimate how far their teaching is meeting the needs of those taught. These vary so widely that they must be met in divers ways. The schools—or "institutes" as they are to be called —must provide both teaching, in the more formal sense, and experience. Teaching means lectures, demonstrations, and discussions, the last mostly bedside discussions. Experience means the opportunity for handling patients, including operating on them, with as great a measure of responsibility as is possible, and in an environment of friendly criticism. In the full training of a specialist, say from a year or two after qualification until he is ready for independent status, experience is the major requirement, and the schools of the federation must be prepared to accept suitable candidates for that training and give them three to five years of such experience as will turn them out first-class specialists. A higher qualification would be an incident in that training. Opportunities for full training will naturally be limited and competition for them should be keen; they might be distinguished as fellowships or by some similar title. For those who do not secure them, and for others who wish to add in a short time to a specialist training already partly completed elsewhere, organised

1. See *Lancet*, April 6, p. 507.

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teaching must be provided in larger proportion, as a substitute for first-hand experience and individual study. This in turn will have to be varied in standard and in concentration to suit varying needs. There is also a contribution to be made to the postgraduate education of the general practitioner, whose interest in recent advances and in the content of the specialties is peculiarly selective. All this calls for an extensive study of the aims and methods of postgraduate medical training, to give it refinement and precision. Discussion, experiment, and criticism are needed, and the federation of the principal London schools engaged in the task should give ideal opportunities for these.

The position of the Postgraduate Medical School and Hammersmith Hospital, in the federation, is of prime importance. Unless it can meet all the range of requirements in general medicine, general surgery, and pathology, the federation will achieve little more than its constituent hospitals have hitherto done. The chequered history of the Postgraduate School is well known. The economy axe cut it to a half at its birth. Only the support of the London County Council, with Hammersmith Hospital, enabled it to live at all. But the fact that Hammersmith Hospital had to remain in alignment with the other L.C.C. general hospitals, especially in being closely tied to its own area in the matter of admitting patients, was a distinct handicap. The hospital is difficult of access, and the school has no compensatory attractiveness in the way of buildings or amenities. In the face of these difficulties the school's achievement in attracting a considerable body of students, in producing some notable pieces of research, and in maintaining its activities throughout the war is very much to its credit. It now requires and deserves generous reorganisation. It must be enabled to turn out a number of fully trained general physicians and general surgeons every year, some to practise as such and some to proceed to further specialisation. It must develop the various kinds and proportions of teaching and experience referred to above. It must increase its research activities, which are not only valuable in themselves but also necessary to the conduct of good teaching and good clinical work. The links between the Postgraduate School and the other members of the federation will presumably be more than their common tie to a central office; they should be personal and intimate. Already some members of the staffs of the special hospitals are visiting specialists to Hammersmith Hospital; the reciprocal appointment of general physicians and even general surgeons from Hammersmith as visiting consultants to the special hospitals would strengthen the personal associations, widen clinical experience, and counteract isolation. The balance and the success of the new federation seem to demand the bold and early expansion of the Postgraduate School—increased staff, increased accommodation (however great the building difficulties), and increased freedom in securing and selecting clinical material.

In other times and in other places postgraduate teaching has owed some of its impetus to the impecuniosity of the teachers. In general its growth has been haphazard. It now makes a fresh start in London, deriving its impulse from a sense of duty towards medicine, and an appreciation of the immense opportunity that London affords.

Annotations

THE FRESH LOAF

ANY who may be dismayed by the Minister of Food's apologetic announcement of an increase in the extraction-rate of flour to 90% should seek comfort in the results of an experiment carried out in the autumn and winter of 1939. Eight subjects were submitted for 3½ months to a diet consisting of unlimited wholemeal bread of 92% extraction (fortified with calcium carbonate) and green and root vegetables, with restricted quantities of other foods. Milk was limited to ½ pint a day, and meat, bacon, and fish to an aggregate of 1 lb. a week. Other weekly allowances were 1 egg, 4 oz. margarine, 4 oz. cheese, 6 oz. fruits, 10 oz. pulses, and 4 oz. rice. The average weekly consumption of oatmeal was 2 oz., and nuts were served once or twice. An autolysed yeast product was used for flavouring.

This diet was in most respects smaller than that which we have known with official rationing. Most of the subjects not only bore up, but performed extraordinary feats of physical endurance in the Lake District; and all remained in excellent health and were proved to be normal or better than normal by every biochemical test that was applied. It was concluded that once an adult had become accustomed to the diet, it was satisfactory for all ordinary purposes. Two members of the party had difficulty in acclimatisation: one owing to her age (she was 70); the other owing to incomplete psychological adaptation. The latter had decided that a grumbler was needed to balance the party, and, though in one way unsatisfactory for the experiment, she gave, before abandoning it at Christmas-time, a clear foretaste of the reaction of one section of the community to a changed diet. Those that persevered approached their meals with gusto, and noticed no monotony. When they later returned to standard rations, their tastes clearly reflected their recent practice—thus underlining once again the necessity to distinguish habit from instinct.

The results, already the subject of comment,[1] have now been fully reported in a breezily written booklet[2] containing a wealth of information which should be studied by all concerned with nutrition. Although the experiment was described in an official report as long ago as 1940, unrestricted circulation has hitherto been prohibited. The grounds for this veto are obscure: it might be thought that the report's problematical value to the enemy would have been outweighed by its capacity to dispel the gloom which surrounded the introduction of rationing in this country. Even now it provides timely confirmation of the observation, made during the German occupation of the Channel Isles, that adults who consume a restricted diet consisting largely of wholemeal bread and vegetables may find it not unpalatable, and will suffer no deterioration in health.

DEATH AFTER SERUM

THE death following the administration of antitetanic serum reported by Dr. Eric Gardner on another page should serve as a warning to all who use serum of any kind in prophylaxis or treatment. Fortunately such accidents are far from common. Park in 1928 estimated that the incidence of alarming symptoms is 1 in 20,000, and of fatalities 1 in 50,000.[3] Refined serum has since reduced these accidents to an even lower level.[4]

The pathogenesis of fatalities from such injections is not clear. The aerated lungs, congested veins, and sub-endothelial hæmorrhages all suggest an analogy with fatal anaphylaxis as seen in the guineapig. On the other hand, in most of the fatal cases reported in man there

1. *Lancet*, 1945, ii, 569; March 30, 1946, p. 467.
2. McCance, R. A., Widdowson, E. M. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1946, no. 254. 1s.
3. Park, W. H. *Amer. J. publ. Hlth*, 1928, 18, 354.
4. Top, F. H., Watson, E. H. *Amer. J. Dis. Child.* 1941, 62, 548.

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has been no history of any previous injection of serum that might have acted as the sensitising dose which appears to be essential for the production of anaphylactic phenomena in animals.[5] But in both man and animals these related conditions are dramatically cured by adrenaline. On the value of preliminary testing for sensitivity to the serum there is a diversity of opinion; certainly little is lost by caution in the rate of administration, but accidents have occurred even after testing for skin sensitivity and injecting in small divided doses. Probably the warning to which most attention should be paid is a history of asthma or of an "allergic diathesis." Observance of the following rules would help to prevent similar fatalities. (1) The injection of serum or bacterial toxoid must be made by the doctor or at any rate in his presence. (2) Whenever possible refined serum only should be used; the smaller bulk of this new product is an added advantage. (3) A sense of security should not be harboured on the strength of there being no history of previous injections of serum; and a history of asthma should be regarded as a warning of serious danger. (4) A syringe containing 1 in 1000 adrenaline should always be at hand.

UNDERGRADUATES AND NATIONAL SERVICE

NOT least of the difficulties that have confronted successive Ministers of Labour in recent years has been that of determining the place of the undergraduate in relation to conscription. Since the Military Training Act came into force in 1939, and more especially after the outbreak of war, the Minister's first duty has been to impress into the Armed Forces as many of the country's youth as was compatible with immediate civilian needs; this obligation applied with equal, if not sterner, force to university students, whose contribution to the efficiency of the Services is particularly valuable. Against this the Minister had to weigh the opposing consideration that the rigorous application of his powers throughout a long war would disrupt the university system and cause a dearth of graduates for years thereafter. These were the issues, and it may be agreed that from the start the balance has been nicely struck. Ministers have wisely sought the advice and coöperation of schoolmasters and vice-chancellors; and as early as June, 1939, Mr. Ernest Brown, then Minister of Labour, was able to announce that he had the unanimous support of these authorities in his offer of postponement or anticipation of military training to undergraduates who were about to begin their studies. Similar restraint and understanding marked subsequent concessions such as those whereby students were allowed, under certain circumstances, to delay enrolment on the active list, and medical students were permitted, provided that they had completed their second term of physiology and anatomy, to complete their training.

Now the tide has turned. The ebb has ended, and the Minister must reorientate himself to direct the flow back to the universities. Now, as after the war of 1914–18, the number of teachers does not suffice for the applicants who seek a university training; and some must be denied admission, at least for a time. Mr. George Isaacs, the present Minister, has announced his proposals for allotting vacancies in the coming academic year. As might be expected, first priority is given to ex-Servicemen and others who have been engaged in important civilian work, "provided they are suitable for acceptance" by a university; and universities may apply for the return of promising students who are in release groups 1–55, or who have completed three years' work of national importance. (The call-up of the latter class will be deferred until their courses are completed.) The remaining places are to be allotted to students born between Oct. 1, 1927, and Sept. 30, 1928, who are recommended for deferment by joint recruiting boards. At the same time the universities may apply for the inclusion of specific students in this age-group, to a maximum of 10% of the available places, even where their admission would exclude older men or ex-Servicemen. The admission in the coming year of students born after Sept. 30, 1928, is to be discouraged, and any that are accepted will be numbered in this 10%. Medical, dental, and veterinary students, who have hitherto been reserved, will now be considered individually on entry by the joint recruiting boards in the same way as students in other faculties.

Once again the Minister has sought and obtained the general approval of the university authorities. The recognition of the ex-Serviceman's claim will be universally supported; and there will be little opposition to his other decisions, provided that every vacancy is immediately and suitably filled.

THE CRYING BABY

THE neonatal period is still a no-man's-land between the obstetricians and the pædiatricians, in which, as the mortality-rates show, there are many casualties. Hence any factual study of the behaviour of newborn infants is to be welcomed. Aldrich, Sung, and Knop[1] have recently recorded observations on the crying of babies in the "modern nursery" of St. Mary's Hospital, Rochester, Minn. Four observers shared the 24 hours between them and for 30 days noted when, and for how long, the babies cried. They also noted the time and duration of "nursing care" and found that "reciprocal relation between crying and nursing care was clearly evident." This not unexpected conclusion has practical implications. They point out, for instance, that at certain times (from midnight to 2 A.M. regularly) there were only two student nurses on duty, and these were occupied with cleaning—a state of affairs familiar enough in children's wards in this country. It is always difficult to get hospital authorities to see that a baby does not make the convenient adult distinctions between night and day. The most important single cause of crying outbursts was delay beyond the regular feeding-time. On the average the babies cried for 2 hours out of every 24.

The authors promise a further study of crying as a "matter individual with each infant," and it is to be hoped that in this they will link up their facts with the theories of psychologists on types of crying, and give more information about the precise discomforts which caused the distresses they seek to relieve.

THE HYPERABDUCTED ARM

ANOTHER facet has been added to our knowledge of hazards to the subclavian vessels and brachial plexus in the posterior triangle and axilla. Attention long ago shifted from the rôle of congenital rib anomalies in this region to the part played by the soft tissues, particularly in the scalenus syndrome; and in recent years the importance of compression of the neurovascular bundle between clavicle and first rib has been noted by Eden,[2] by Walshe, Jackson, and Wyburn-Mason,[3] and by Le Vay.[4]

Now Wright[5] has recorded 5 examples of a similar neurovascular syndrome produced by hyperabduction of the arms in patients who were in the habit of sleeping with their hands behind the head. In 4 of these the syndrome was bilateral; 1 had gangrenous changes in the finger-tips. All were cured by sleeping with the arms by the side. Wright examined 150 young adults, and found that in 82–83% the right and left brachial pulses were obliterated by hyperabduction of the arms

5. Vance, B. M., and Strassmann, G. *Arch. Path.* 1942, **34**, 849.

1. Aldrich, C. A., Sung, C., Knop, C. Q. *Proc. Mayo Clin.* 1945, **20**, 347.
2. Eden, K. C. *Brit. J. Surg.* 1939, **27**, 111.
3. Walshe, F. M. R., Jackson, H., and Wyburn-Mason, R. *Brain*, 1944, **67**, 141.
4. Le Vay, A. D. *Lancet*, 1945, ii, 164.
5. Wright, I. S. *Amer. Heart J.* 1945, **29**, 1.

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to the fully elevated position. There was considerable variation in the degree of abduction at which the pulse first disappeared, and in some cases it disappeared only when the limb was forced backwards as well as being abducted, so that a feeling of tension in the axilla was produced. The neurological symptoms corresponded with the vascular features; and the impression was that these were normal findings, but that, favoured by specific conditions in individuals of certain physiques, pathological changes might ensue. At the critical angle of abduction, when the pulse was on the point of obliteration, certain ancillary factors were observed to complete its disappearance—deep inspiration, rotation of the head, hyperextension of the neck, or contraction of the pectoral muscles. Further work based on experimental dissections made it clear that neurovascular compression may occur at two sites. One is the costoclavicular interval, with which we are already familiar. The other is where the bundle passes behind the pectoralis minor, just medial to the coracoid process; here it is relaxed and free from compression in adduction, but abduction stretches it around and underneath the root of the coracoid, and tautens the overlying pectoralis against it. In hyperabduction, both mechanisms may operate; but the subcoracoid-pectoralis-minor syndrome may manifest itself at only 90 degrees of abduction when the costoclavicular interval is still wide.

Wright points out that no treatment is needed beyond sleeping with the arms by the side and giving up any occupational strain, such as house-painting; but if, in addition, features of costoclavicular compression are present, resection of part of the first rib may be necessary.

We are gradually evolving a clear picture of the pathology behind the numerous vague pains in the neck and arms, and we may resort to the diagnosis of brachial neuritis a little less often. The new knowledge will make us ponder even more ruefully on the penalties of abandoning the quadruped position.

INFIBULATION IN THE SUDAN

MOST, though not all, teachers of the Mohammedan religion regard circumcision as obligatory for males; but circumcision of females is not considered essential, though believed to be advantageous. As prescribed by Mohammedan law, female circumcision is restricted to the removal of a piece of skin "the size of a date-stone" from the vulva; and it may have originated as an aid to cleanliness in a region where water is scarce. In many parts of Africa, however, custom dictates more drastic operations. In Egypt the clitoris and the labia minora are removed, either as a form of toilet or to lessen sexual desire.[1] In the Sudan, and also in Ethiopia, Somaliland,[2] and parts of Kenya and West Africa, the more extensive "pharaonic circumcision" or infibulation is performed in order to prevent intercourse before marriage. In these countries it is usual, when the girl is about six years old, for the clitoris and large parts of the labia minora and majora to be excised by an untrained midwife, using an unsterilised razor; the shrieks of the child are drowned by the cries of female relatives who hold her down. A reed or match is then inserted into the vagina to maintain the patency of the orifice, and the legs are strapped together for forty days to encourage union of the two sides. In a few tribes, thorns are used as sutures, and these are held together by thread wound round their projecting ends. When the child grows up the scar is incised at each confinement, but is usually restored later by further ligatures.

It is now 21 years since the Kitchener School of Medicine was founded to train Sudanese doctors. These doctors, together with the enlightened Moslem religious leaders, have set their faces against the continuance of this barbarous practice in their country, and last year the Sudan Government sought the opinion of the Advisory Council for Northern Sudan (an almost entirely Sudanese body) on the possibility of suppressive legislation. The inquiry revealed that the survival of the custom is due mainly to the intense conservatism of the women themselves; the mere report that its abolition was under discussion caused a wave of circumcisions of girls of still younger age than usual. The council nevertheless passed by 18 votes to 9 a request to the government to prepare legislation for the suppression of the pharaonic type of circumcision, and a draft was presented to the Advisory Council last November. The proposed addition to the penal code would make female circumcision a criminal offence, except in the normal Mohammedan form; it would thus not be unlawful "to remove the free and projecting part of the clitoris" with the consent of the woman or her guardian. The council favoured the proposal generally, and it is probable that the Sudan government will proceed with the projected legislation. It is hoped that in so doing they will have the support of enlightened opinion among the Sudanese themselves, who can surely not desire the continuance of a custom which is elsewhere regarded as cruel, senseless, and actually harmful. The spread of female education would no doubt in time put an end to this outrage; but female education is a plant of slow growth, and there is no justification for deferring action to arrest this torture of children in a land which aspires to civilisation.

1. Girgis, B. *Lancet*, 1936, i, 170.
2. Melly, J. M. *Ibid*, 1935, ii, 1272.

PHOTOMETRIC MEASUREMENT OF BACTERIAL GROWTH

SINCE bacteriology began, comparison by eye of the relative opacities of bacterial cultures has been a routine method of judging bacterial growth in liquid media. It is now easy to express such opacities quantitatively, with an accuracy of ± 1 to 3%, by using a photoelectric absorptiometer. Less than £100 will buy the complete equipment, which is easy to operate and provides direct scale readings of optical densities of liquids. Optical density is defined as the logarithm of the ratio of the intensity of light incident on a system, to that of the light transmitted by it, but this definition may be forgotten, since in ordinary suspensions the optical density—that is, the instrument readings—are proportional to the mass of bacteria in suspension. Some 20 cultures can be compared, taking duplicate readings of the instrument, in an hour. This method is now often adopted in microbiological assays for estimating vitamins of the B group.[1] In such cases, opacities given by bacterial growth in media containing known quantities of, for example, riboflavine, are compared with those of the growth in media containing the material to be assayed.

When applied to more purely bacteriological problems, such as bacterial growth itself, or the influence on it of chemotherapeutic agents, the information provided by photometric measurements must be considered more carefully. Of the well-established measures of bacterial growth, bacterial mass is most closely comparable with optical density. A factor obtained by measuring the dry weight and optical density of the same suspension is often used to convert the readings of the instrument to the dry weight of bacteria present. Photometric readings are not necessarily proportional to numbers of bacteria; they would register little change if every cell of a suspension divided into two without growth of bacterial substance, but would increase if each cell grew bigger without dividing. And they do, of course, measure total cell population whether or not the cells are viable. It would not be admissible, therefore, to try to standardise a photoelectric absorptiometer by comparing its readings with the results of "viable counts." Among the minor points to be remembered

1. e.g., Lampen, J. O., Peterson, W. H. *J. biol. Chem.* 1944, 153, 193.

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is that the instrument will respond to any precipitate or colour change which occurs in the medium.

In following bacterial growth, photometric measurements are complementary to methods in which individual bacteria are counted, whether as viable organisms after plating or as total organisms by using a hæmocytometer. Both these older methods can deal with much more dilute suspensions than can the photometer. The ordinary instrument will begin to give significant readings only about the point at which the first slight opacity becomes just visible to the naked eye. Direct readings with the absorptiometer can be obtained over about a 30-fold increase in density beyond that point. For denser suspensions, known dilutions can easily be prepared to fall on the instrument's scale. The most serious limitation of photometers, therefore, is their insensitivity to light growth. Their great virtue lies in their provision of easy, frequent, and fairly accurate measurements of the growth of cultures in their later or denser phases. Peculiarities of growth can thus be clearly defined—peculiarities which with other methods might be overlooked or dismissed as anomalies in one or two counts of a series. A recent study[2] of the growth of staphylococci in concentrations of penicillin (0·008–0·015 unit per ml.) which inhibit growth only slightly provides an instance of this. The cultures in the presence of the drug showed several phases: growth was inhibited after a short incubation-period, and then lysis occurred; after some hours growth began again and reached a level higher than before but again was inhibited and followed by lysis; growth began once more after a further interval, and this time reached the level attained in the uninhibited controls some hours earlier. This seems to confirm Bigger's[3] findings that penicillin acts only on growing organisms, but that a proportion of organisms of a culture are in a persistent state and can grow later. The progeny of the "persisters" are about as sensitive to penicillin as the bulk of the original culture.

WOMEN DOCTORS IN AMERICA

In the United States, as here, there are many women doctors in the health services; but women form a smaller proportion of the profession. The prospects for American women in medicine have lately been considered in a bulletin from the Women's Bureau of the U.S. Department of Labor,[4] which records the number practising in 1940 as 7600, or 4·6% of the 165,000 practising doctors. In this country there are between 7000 and 8000 women among about 53,000 doctors on the British part of the Medical Register, amounting to some 13–15%; so it seems that the career of medicine attracts a lower proportion of American than of British women. There is also some reason to think that women here make a larger contribution to specialist medicine than they do in the States: in 1941 only 5% of American women doctors were qualified as specialists, compared with 8% of men.

Some of the reasons for these differences appear in the bulletin. Training is even longer and more expensive in the States than in Britain, and though special loans were offered during the war, women were loth to take them "since such an obligation is felt to be a bar to matrimony, and furthermore, since few families urge girls into college unless financial provisions can easily be made for them." The balance of the sexes in America is such that women can count on selective opportunities for marriage; Dr. Jessie Gray is quoted in the bulletin as saying that "marriage at an earlier age than is compatible with a medical education will always be more attractive to the vast majority of girls," and she concludes there will never be any great surge of women into medicine. Apart from marriage, eight other careers compete with medicine for the educated girl: teaching, nursing, music and music teaching, social welfare, library service, college teaching, art and art teaching, and journalism. To many women nursing offers a more attractive career than medicine, and American nursing carries the rewards and status which English nursing lacks.

Women students find difficulty in gaining places in medical schools, for though all except four schools in the United States receive them, only about half the applicants—either men or women—are normally accepted. Women also find it difficult to get residents' posts, especially in surgery; and though they have done well in pædiatrics, psychiatry, and public health they do not easily gain administrative appointments or posts in medical research and teaching. Most women doctors agree that a woman encounters, on the whole, more opposition in her medical career than a man; but the war has increased her opportunities temporarily and may have done so permanently. The bulletin concludes that the increased demand for doctors of all types in the coming years will more than offset the increase in supply during the war; and that women now in training are likely to have greater rather than poorer opportunities than their forerunners.

FORMATION OF GASTRIC HCl

William Prout, a man who deserves more recognition than he is ever likely to receive, was a biochemical visionary of the highest order, and it was he who discovered that the walls of the stomach secrete hydrochloric acid. In his Goulstonian lectures,[1] delivered before the Royal College of Physicians in 1831, he described his discoveries of the previous 10 years, and as a result he was reviled and pilloried by his contemporaries for his heretical beliefs. The first attempt to find out how the acid was formed seems to have been made by Claude Bernard, who injected ferrocyanide and iron lactate into an animal. Prussian-blue was formed in the gastric mucosa but not apparently in the gland cells or ducts, and Bernard concluded that the acid was formed from some neutral substance secreted by the cells. Similar attempts to find out the origin of the HCl were made by other observers using inorganic substances and vital dyes. One theory which has been seriously considered is that alkaline sodium phosphate in the cells reacts with carbonic acid to form acid sodium phosphate, which in turn reacts with NaCl to give alkaline sodium phosphate once more—and HCl. This view has been supported by a histochemical demonstration that the gland cells are exceptionally rich in phosphates.[2] A finding of Claude Bernard[3] which seems to have been confirmed by many people is that raising the partial pressure of CO_2 in the circulating plasma increases the concentration of HCl in the gastric juice.[4] The gastric mucosa has also been shown to be very rich in carbonic anhydrase, suggesting that part of the mechanism of acid secretion is a rapid synthesis (or breakdown!) of carbonic acid. There is in short little doubt that the HCl of the gastric juice must ultimately be formed from the NaCl of the circulating plasma, and that as Cl ions leave the Na to pass into the stomach, HCO_3 takes their place.

Against this background two new theories have been put forward, one by the Dublin workers, Conway, FitzGerald, and Walls,[5] and the other by two Chicago

2. Bonet-Maury, P., Perault, R. *Nature, Lond.* 1945, **155**, 701; *Ibid*, 1946, **157**, 131.
3. Bigger, J. W. *Lancet*, 1944, ii, 497. Cf. Hobby, G. L., Dawson, M. H. *Proc. Soc. exp. Biol., N.Y.* 1944, **56**, 178. Miller, C. P., Foster, A. Z. *Ibid*, p. 205.
4. The Outlook for Women in Occupations in the Medical Services: Women Physicians. Bulletin 203, no. 7.

1. Prout, W. *Lond. med. Gaz.* 1831, **8**, 257.
2. Best, C. H., Taylor, N. B. Physiological Basis of Medical Practice, London, 1943.
3. Bernard, C. Leçons de Physiologie Operatoire, Paris, 1879.
4. Adams, W. L., Welch, C. S., Clark, B. B. *Amer. J. Physiol.* 1943, **139**, 356.
5. Conway, E. J., FitzGerald, O., Walls, D. *Nature, Lond.* 1945, **156**, 477.

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investigators, Bull and Gray.[6] In some respects these theories resemble each other; in others they are diametrically opposed. The Dublin school starts from the observation that high concentrations of hydrochloric acid can be formed in the medium when ordinary bakers' yeast is set to ferment in a solution of KCl. Conway suggests, therefore, that an isotonic solution of KCl is secreted into the intracellular canaliculi, and that as the fluid passes down them K ions are reabsorbed and H ions take their place. The reabsorbed K ions neutralise some keto acid, such as pyruvic acid, which is being formed along the inner side of the membrane of the canaliculus by cellular metabolism; the pyruvate is then decarboxylated, and CO_2 or H_2CO_3 set free, to pass backwards into the plasma, there to recombine with Na. It will be noted that this theory involves a transference of basic ions across the cell membranes and is somewhat similar to an older one turning on the secretion of NH_4Cl, with subsequent reabsorption of NH_4 and replacement by H ions.

The American theory involves the secretion of an organic (probably pyruvic) acid into the canaliculi with subsequent reabsorption of the acid radicles and their replacement by Cl ions. The organic radicle is at once decarboxylated when it re-enters the cell, and so the necessary gradient for the continuous diffusion of the pyruvic radicles back into the cell is maintained. This is rather an attractive theory and it differs essentially from Conway's in postulating a transfer not of cations but of anions across the membrane of the canaliculi. Neither the American nor the Irish workers discuss their theories in the light of much of the previous work, and it is not clear on either theory why raising the partial pressure of CO_2 in the circulating plasma favours the formation of HCl, which seems to have been established. On either theory, however, it could be predicted that a deficiency of aneurine or nicotinic acid would lead to achlorhydria, because these vitamins are necessary for the production and destruction of pyruvic acid, and clinical experience supports both these predictions.

It seems strange that in spite of all the biochemical discoveries of the last 120 years the origin of the HCl so ably demonstrated by Prout still eludes us.

ARTERIAL SPIDERS

DURING the last seventy years many isolated reports of the condition known variously as nævus archnoideus, stellate angioma, étoile vasculaire, or arterial spider have appeared, and Bean[7] has now brought them together into a unified description, and incorporated data derived from 430 cases he has observed.

The arterial spider varies considerably in shape and size, attaining a diameter up to 1·5 cm., and consists essentially of a bright red body, 1 mm. or more across, legs, and a surrounding area of erythema. The body, when large, may be raised as much as 5 mm. above the surface and usually exhibits pulsation which is sometimes visible. The legs, or radicles, consist of branching vessels which radiate out parallel to the plane of the skin, just below its surface, gradually fading towards the periphery and sometimes uniting to form a loosely or closely knit reticulum which in advanced cases may become a telangiectatic mat. The area of erythema, which may be circular or star-shaped, usually extends a few millimetres beyond the legs, but if the legs are not easily visible the spider may appear as a circular area of erythema with a central red punctum or pulsating papule. The whole has a characteristically fiery red colour. The main vessel of the spider is an artery larger than those usually arising in the subcutis, and the blood flows centrifugally from the punctum towards the periphery. The spider is not an arteriovenous shunt in the sense of a glomus body, nor is it comparable to an arteriovenous aneurysm, because the branches of the central artery carry arterial blood into smaller vessels and thence into capillaries from which in turn the blood is collected by veins. The arterial spiders occur most commonly on the face and neck, and in decreasing frequency over the shoulders, thorax, upper arm, lower arm, back of hands, and fingers. They are rare on the lips, ears, nail beds, and palms, and less than 1% occur below the level of the umbilicus. They are seldom seen on hairy sites, such as the scalp, axillæ, or pubic region. Bean suggests that this distribution may be associated with the varying tone of the small vessels of the skin, the spider tending to form where vascular tone is relaxed, as in the blush area. That they are associated with a generalised disturbance of the cutaneous vessels is suggested by the accompanying cutaneous phenomena. Thus it is not uncommon to find them on "paper-money skin," in which there are scattered strands of vessels resembling the silk threads in American notes. They may also arise in people with palmar or plantar erythema—a reddening of the palms or soles sometimes associated with hepatic disease.[8]

Arterial spiders are usually found in one of three conditions—liver disease, pregnancy, and deficiency of the vitamin-B complex. However, Bean observed them in 107 apparently normal people whose ages ranged from less than a year to 79 years. Other conditions in which they have been described include scleroderma, Cushing's syndrome, and rheumatic fever. The only real diagnostic problem is the differentiation from Osler's disease (hereditary hæmorrhagic telangiectasis), and the differences are sufficiently clear to justify a complete separation of the two. Thus in Osler's disease the telangiectases are smaller, bluer, and less liable to pulsate; they are ubiquitous in distribution, bleed freely, and never appear or disappear suddenly as may the spider. The ætiology of arterial spiders is still unsolved, and Bean suggests that they arise from an alteration in the small arteries of the skin due to "an increase or qualitative change in circulating œstrogens or hormones of related chemical structure, a change that is normal in pregnancy, pathological in hepatic disorders in which the liver fails in its function of keeping the 17-ketosteroids in balance and at a proper level."

6. Bull, H. B., Gray, J. S. *Gastroenterology*, 1945, **4**, 175.
7. Bean, W. B. *Medicine, Baltimore*, 1945, **24**, 243.
8. *Amer. Heart J.* 1943, **25**, 463.

MIDDLESEX HOSPITAL'S BICENTENARY

THE Middlesex Hospital this year celebrates the 200th anniversary of its foundation. Though less venerable than Bart's, which is in its 400th year, the Middlesex has no less eventful a history. Its present title came into use in 1746, but the institution really originated in 1745 with the opening of the "Middlesex Infirmary" in two dwelling-houses in Windmill Street. In 1747 the hospital, founded for the sick and the lame, began to accept lying-in women. Ten years later, when it was transferred to a new building on part of the present site, the Middlesex was committed to a process of expansion which has led to its present eminence. Among this year's celebrations will be three addresses: Chemistry and Medicine by Sir Robert Robinson, P.R.S., on May 20; The Future of the Medical Sciences by Sir Edward Mellanby, F.R.S., on May 22; and The Middlesex and Medicine by Sir Lionel Whitby on May 23.

THE next session of the General Medical Council will begin on Tuesday, May 28, at 2 P.M., when Sir Herbert Eason, the president, will deliver an address.

THE order of the White Lion of Czechoslovakia has been conferred on Mr. Geoffrey Knight by President Benes in recognition of his services as neurological surgeon to the forces of the Republic.

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Parliament

NATIONAL HEALTH SERVICE BILL

THE debate on the second reading of the National Health Service Bill ended with a majority for the Government, in a crowded and effervescing House, of 359 to 172. A number of Conservatives abstained from voting against the Bill, and Liberals and Independents voted with the Government.

Mr. BEVAN'S opening speech was quiet in tone, expository, and explanatory; and as both sides are committed by their Coalition white-paper to a 100% comprehensive service the debate could not entirely follow the lines of party controversy.

The Opposition opened badly with Mr. Richard Law's personal attack on the Minister as lacking knowledge of this "very important" matter and setting his own "intuition and judgment against all those best-informed in the medical profession." Mr. Law seemed unaware of the contents of the regional hospital surveys made by distinguished representatives of the medical profession since they were inaugurated by Mr. Ernest Brown as Minister of Health in 1941. He also fell into error when he attributed to the Royal College of Obstetricians the statement that the Minister's proposals "were likely to lead to a great increase in maternal mortality." The truth of this was flatly denied by a Government supporter, and then Dr. Morgan produced the college's memorandum and passed it to Mr. Law, who was unable to quote anything except the statement that "the care of the pregnant woman . . . cannot be discharged with the maximum safety to the two lives at stake if it is shared between different administrative bodies."

Then came speech on speech from medical and non-medical members—doctors for once being able to "catch the Speaker's eye" in unusually large numbers. Sir Henry Morris-Jones complained that "consultations" should have been more thorough and said the Bill should refer to "a national disease service." He thought that we had neither the doctors nor the hospitals to work the service as it would need to be done, but he regarded the present distribution of doctors as a fair one as between the "under-doctored" and "over-doctored" areas. Mr. Key, parliamentary secretary to the Ministry of Health, made a very good impression on the House by his vigorous advocacy of the Bill and his evident knowledge of its intricacies. When Mr. Willink came to lead off for the Opposition he was not happy. He became involved in statements on policy on which the Minister rose and roundly accused him of making "a series of statements purporting to describe departmental arrangements which were made by the last Government in modification of the [Coalition] white-paper and which have never been published." His speech attacked policy in general, the general-practitioner policy, and basic salaries, and he had many interruptions. Mr. Clement Davies, Leader of the Liberal Party, wished the Minister well from "the bottom of my heart."

On the last day the temperature rose considerably, and the debate ended in a clash between Mr. Arthur Greenwood, replying for the Government, and Mr. Willink protesting against the document issued by the B.M.A. which spoke of the "administrative structure put forward by the Minister as a possible alternative to that outlined in the white-paper." Mr. Willink did not admit that he was ever committed to recommend these proposals to the Cabinet.

And so to the division lobby and afterwards to the smoking-room, where it was agreed that in the committee stage which will begin next week we shall get down to the 10% of difference that divides us.

MEDICUS, M.P.

THE DEBATE

ON April 30, in moving the second reading, Mr. ANEURIN BEVAN, Minister of Health, said that in the last two years there had been such a clamour from sectional interests that we were in danger of forgetting why the proposals had been brought forward at all, and he welcomed this opportunity of giving consideration not to this or that interest but to the requirements of the British people as a whole. But any scheme dealing with national health, he continued, must be conditioned and limited by the evils it was intended to remove.

WHY THE SCHEME IS NECESSARY

All parties agreed that money ought not to be permitted to stand in the way of obtaining an efficient health service. The first evil we must deal with was the anxiety caused by doctors' bills. Everyone ought to be able to receive medical and hospital help without being involved in financial anxiety.

In the second place, National Health Insurance did not provide for the self-employed nor for dependants, and no matter how ill a patient was, if he ceased to be insured he ceased to have free doctoring. Furthermore, it gave no backing to the doctor in the form of specialist services. The doctor must use his own personal connexions to obtain for his patients hospital treatment and specialists' advice, and for an overwhelming number of poor people specialist services were not available.

Our hospitals, Mr. Bevan pointed out, had grown up without plan or system; they were unevenly distributed over the country, and often the best facilities were available where they were least needed, while in the older industrial districts they were inadequate. Many hospitals were too small. About 70% had less than 100 beds, and over 30% less than 30. No-one could pretend that hospitals so small could provide general-hospital treatment. There was a tendency to defend the very small hospital on the ground of its localism and intimacy, but if a hospital was to be efficient it must provide a number of specialised services. Though not a devotee of bigness for bigness' sake, Mr. Bevan confessed he would rather "be kept alive in the efficient if cold altruism of a large hospital than expire in a gush of warm sympathy in a small one."

The condition of the teeth of the people of Britain, he affirmed, was a national reproach. Since dental treatment had to be bought, it had not been demanded on a scale sufficient to stimulate the creation of sufficient dentists, and there was a woeful shortage of dentists. About a quarter of the people of Britain could obtain their spectacles and get their eyes tested with the help given by the approved societies, but the general mass of the people had no such facilities. Again, insufficient attention had been given to deafness, and to the provision of cheap hearing-aids and their proper maintenance. Mr. Bevan added that he hoped soon to be able to make an announcement on that question. Another disability of the health services was the isolation of mental health from the rest of the services. Although this Bill did not alter the Lunacy Acts—that would come later on—it did for the first time bring mental health into the general stream of the health services.

One of the first merits of the Bill was that it provided a universal health service to the whole population without insurance qualification, though there would be some limitations for a while because of shortages. For instance, there were not enough dentists, and we must give priority to expectant and nursing mothers and to children, and later to adolescents. But the aim was to build up a service for the whole population. There were shortages, too, of nurses and hospital accommodation, and it would be some time before the Bill could fructify fully in an effective universal service. Specialists would be available not only at institutions but for domiciliary

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visits. They would be at the back of the general practitioner should he need them.

POSITION OF THE HOSPITALS

In paying tribute to the voluntary hospitals' long history of devotion and sacrifice, Mr. Bevan said it would be a most frivolously minded man who would denigrate their immense services. But they had been established often by the caprice of private charity. Two hospitals close together often provided the same specialist services, while other areas had not that kind of specialist service at all. Endowments were often left to hospitals in those parts of the country where the well-to-do lived, while in many industrial and rural districts there was inadequate hospital accommodation. Many voluntary hospitals were too small, and to leave them as independent units was impracticable.

He believed it was repugnant to a civilised community for hospitals to have to rely upon private charity. Flag-days ought to be left behind. But the implications in the change were considerable. When the all-in insurance contributions fell to be paid it was estimated that 80–90% of the revenue of voluntary hospitals would be provided by public funds, and it would be a misuse of language to call them voluntary. To take over the voluntary hospitals would, he realised, give rise to resentment in many quarters. But he was concerned not with the hospital authorities, but with the people the hospitals were supposed to serve. Every investigation had established that the proper hospital unit must comprise about 1000 beds. General and specialist services could be provided only in a group of that size. This meant that hospitals must be linked together, and that could not be done effectively if each hospital was a separate autonomous body. Many cottage hospitals strove to give services that they were not competent to give, and the welfare of the patients was sacrificed to the vaulting ambitions of those in charge of the hospital. But if these hospitals were to be taken over, who was to be the receiver? He had examined the local-government hospital system to find that many local authorities had never been able to exercise their hospital powers. They were too poor. They were too small. Many had inherited their hospitals from the poor-law system, some with monstrous buildings, a cross between a workhouse and a barracks or even a prison. He had had to reject the local-government unit because the local-authority area was no more an effective gathering-ground for the patients of the hospitals than the voluntary hospitals themselves. London was an example of being too large and too small at the same time. If we intended to universalise the best, to give the same standard of service to every citizen, how could that be articulated through a rate-borne institution? The local authorities were too small, and their financial capacities were unevenly distributed. The only thing to do was to create an entirely new hospital service to take over voluntary and local-government hospitals, and to organise them as a single hospital service throughout the country, with the nation itself carrying the expenditure.

REGIONAL HOSPITAL BOARDS

The effective hospital unit, it was held, must be associated with the medical school. If hospitals were grouped in about 16 to 20 regions around the medical schools within the regions, there would be the wide range of disease and disability to provide the basis for the specialised hospital service. By grouping hospitals around the medical schools the general practitioners would also be kept in more intimate association with medical thought and training. Moreover, the body carrying out the hospital services would be at the same time the planners of the hospital service. The regional hospital organisation was also to be the authority associated with the specialised services which could be made available for areas of that size.

When the Bill reached the committee stage there would doubtless be different points of view about the constitution of the regional board. It was not intended, Mr. Bevan pointed out, that the board should be a conference of persons representing different interests and organisations. That would mean that the board would not be able to achieve reasonable homogeneity. It was intended that the boards should be drawn from members of the profession, from the major public-health authorities in the area, from the medical schools, and from those who had long experience in voluntary hospital administration. The Government hoped before long to build up a high tradition of hospital administration in these boards. Though he was prepared to discuss how the boards should be constituted, he hoped that he would not be pressed to make them merely representative of different interests and different areas.

THE GENERAL PRACTITIONER

General practitioners, Mr. Bevan proposed, should not be under direct contract with the Ministry of Health, but under contract with entirely new bodies on which doctors, dentists, and chemists would have half the representation. To some extent he sympathised with the medical profession's resistance to coming under the authority of local government, and the Government's scheme did not involve this. The scheme provided a greater degree of professional representation for the medical profession than any other scheme. But he believed that the demands of democracy were not satisfied by the opportunity of putting a cross against someone's name every four or five years. Democracy meant active participation in administration and policy, and doctors should be given full participation in the administration of their own profession, subject to safeguarding the communal interests.

Doctors would not become civil servants. Indeed, one of the advantages of the scheme was that it did not create an additional civil servant. Nor did it impose any constitutional disability upon anyone. Indeed, by taking the hospitals from the local authorities and putting them under the regional boards, many people would be enfranchised who were now disfranchised from participation in local government. So far from this being a huge bureaucracy, with all the doctors little civil servants and the slaves of the Minister of Health, the doctors were under contract with bodies, not under the local authority, which were open to their own influence and control.

At the moment the distribution of doctors throughout the country was most uneven. In South Shields before the war there were 4100 people to each doctor; in Bath 1590; in Dartford nearly 3000; in Bromley 1620; in Swindon 3100; in Hastings under 1200. If the health services were to be carried out there must be a redistribution of general practitioners, and one of the first consequences of redistribution was the abolition of the sale and purchase of practices. If doctors were to be available where they were needed, a new doctor could not be allowed to go in because he had bought somebody's practice. Every argument advanced about the value of the practice was itself an argument against freedom of choice, because the assumption underlying the high value of the practice was that the patient passed from the old doctor to the new. Mr. Bevan had never admitted the legal claim of the doctors to compensation, but he did admit that great hardship would be inflicted if there was no compensation, and he thought it would be most unjust if no compensation were paid for the value of the practices destroyed. The sum of £66 million was large, and everyone would admit that the doctors were being treated generously. But if the Government provided superannuation and

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gave credit for back service, it would cost £35 million. Furthermore, payment would be made to the dependants when the doctor died, or when he retired, and so it was spread over a number of years. The profession itself would be asked to advise as to the distribution of the total sum.

Some doctors claimed that the scheme meant direction, but no direction was really involved. All the doctors in an area would be entitled to enter the public service in that area. A new doctor's application to set up in practice in an area would be referred to the Medical Practices Committee, a mainly professional body, and if it were held that already there were sufficient doctors there, the application would be refused. By negative control over the number of doctors they hoped to bring about a positive control over the medical services all over the country. A new doctor would have to find his practice in a place inadequately served.

REMUNERATION

At the moment he could not announce the rates of remuneration, but he could deal with some of the underlying principles. He was not himself in favour of a full salary scale. He did not believe the medical profession was ripe for it. There must be some reward for zeal and some punishment for lack of it. Therefore it was proposed that capitation should remain the main source of remuneration, but there would be a basic salary. The young doctor needed to be kept alive while he was building up his lists. The basic salary could be increased in unattractive areas, and could also be the means of offering additional remuneration for special acquirements. The basic salary must not be too much, however, or it might become a disguised form of capitation.

The general practitioner would still be able to obtain fees, though not from patients on his own or his partner's lists. It would be impracticable to prevent doctors from taking private patients, and the attempt might lead to a black market. And there ought to be no bar to anyone having advice from another doctor rather than his own. He could have the consultation and pay the fee. If he found the second doctor was better than his own he could transfer to him, because it would be unreasonable to continue paying fees to a doctor whose services could be had free. Mr. Bevan thought however that the amount of fee-paying on the part of the general population would be small. Indeed, he confessed that, if the amount of fee-paying was large, the system would have broken down. Specialists in the hospitals would also be able to have fee-paying patients. He knew these concessions were criticised, and he sympathised with some of the reasons. But unless they permitted some fee-paying patients in the public hospitals there would be a rash of nursing-homes all over the country. Some people wished to pay for additional amenities, like privacy in a single ward. They must aim at providing privacy for everybody, but that must wait till additional hospitals were ready. Further, they would risk losing many specialists from the hospitals who would go to nursing-homes, and he thought nursing-homes ought to be discouraged.

HEALTH CENTRES

The health centres, said Mr. Bevan, were important; for to the extent the general practitioner could operate through health centres in his own practice, to that extent the general standard of the profession would be raised. Apparatus not available in the doctor's own surgery would be in the centre, and the maternity and child-welfare clinics for the local authorities might also be housed there. The provision of health centres was a duty imposed on local authorities. Some criticised the proposals as involving trichotomy between the regional board, the local authority, and the health centre; but they could not take all the health services from the local authorities because there were many immediate and personal services which the local authority could do better than anyone else. There would be large health centres with a dental clinic, maternity and child-welfare services, and general-practitioner consultative services, and smaller centres where the general practitioners could see their patients, because it was necessary to have centres near the homes of the patients. He admitted that it would be some time before they could get health centres all over the country, owing to the absence of facilities. Some thought that the preventive services ought to be under the same authority as the curative services, but were housing, sanitation, water drainage, and food inspection to be placed under the regional boards? Such a regional board would need to meet in the Albert Hall. There must be some frontier at which the local authority joined the public-health service. Day was joined to night by twilight, but nobody suggested that this was a contradiction in Nature.

It was also suggested that because maternity and child-welfare services came under the local authority, and gynæcological services came under the regional board, that would make for confusion, but why should it? Continuity was maintained by the user.

AMENDMENTS

Replying to the Liberal amendment, Mr. Bevan confessed himself astonished that Sir Henry Morris-Jones and his friends were

> "unable to agree to a measure containing such far-reaching proposals embodying the entire population without any consultation having taken place between the Minister and the organisations and bodies representing those who will be responsible for carrying out its provisions. . . ."

He pointed out that he had met the medical profession, the dental profession, pharmacists, nurses and midwives, voluntary hospitals, local authorities, eye services, medical aid services, herbalists, insurance committees, and other organisations. He had had 20 conferences, and his officials had had 13 conferences, with different branches of the profession. The real criticism was that he had not conducted negotiations. If there was one thing that would spell the death of the House of Commons it would be for a Minister to negotiate Bills before they were presented to the House. By previous negotiation a Minister put himself into an impossible position, "because if he has agreed things with somebody outside he is bound to resist amendments from members in the House. I protested bitterly against this when I was a private Member, and I am not prepared, strange though it may seem, to do something as a Minister which I thought was wrong as a private Member. So there has not been negotiation, and there will not be negotiation, in this matter. The House of Commons is supreme, and the House of Commons must assert its supremacy and not allow itself to be dictated to by any body, no matter how powerful and how strong it may be."

The consultations he had referred to had produced quite a considerable amount of agreement. The opposition to the Bill was not as strong as it was thought it would be. On the contrary, there was considerable support for the measure among the doctors. He had been rather aggrieved by some of the statements which had been made. They had misrepresented the proposals to a very large extent, but as these proposals became known to the medical profession they would appreciate them, because nothing should please a good doctor more than to realise that in future neither he nor his patient would have any financial anxiety arising out of illness.

The main Opposition amendment expressed indignation at the extent to which the Bill interfered with charitable endowments, but Mr. Bevan affirmed that he had found good precedents and asked whether the

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intelligent planning of the modern world must be prevented by the endowments of the dead. The teaching hospitals were to be left free with all their liquid endowments and with more power. Something like £32 million belonging to the voluntary hospitals was to be used as a shock-absorber between the Treasury, the Central Government, and the hospital administration. He was prepared to consider whether other relaxations of the scheme were possible.

The whole scheme, he ended, would place this country in the forefront of all countries in the world in medical services, and would be a great contribution towards the well-being of the common people of Great Britain.

First Day's Discussion

Mr. RICHARD LAW in opening the debate said that the proposals were feared and distrusted by the great majority of those who would be called upon to make them effective. The British Hospitals Association, the British Medical Association, and the British Dental Association were opposed to the Bill, and the three Royal Colleges had criticised it with varying emphasis. The Royal College of Surgeons had passed a resolution condemning aspects of the proposals in the most categorical terms. The powerful advocacy of its president, Lord Moran, had been unable to influence the Royal College of Physicians to give support to the proposals for taking over the voluntary hospitals. The Royal College of Obstetricians, Mr. Law continued, had said that the Minister's proposals were likely to lead to a great increase in maternal mortality. When pressed for chapter and verse, Mr. Law withdrew this statement and read the following paragraph from a report (which Dr. Morgan was happily able to lend him) recording the college's conviction

> "that the care of the pregnant woman, whether at home, in the clinic, or in hospital, is a responsibility which cannot be discharged with the maximum safety to the two lives at stake if it is shared between different administrative bodies."

The Opposition, he continued, accepted the principle of a national comprehensive 100% service and the consequences which flowed from that acceptance, including a greater degree of coördination than before. But they believed that the Minister could have established a health service equally comprehensive, better coördinated, and more efficient if he had not been determined to sweep away the voluntary hospitals, to remove the municipal hospitals from the local authorities, and to impose on the medical profession a discipline unsuited to the practice of medicine. Admittedly the present hospital service was inadequate and badly distributed, but surely the reason for this inadequacy was lack of money. Once the community accepted the principle that it would pay for the service, the inadequacy would disappear. Mr. Law urged that the regional board should be not a controlling and administrative board but a planning board leaving the hospitals, whether voluntary or municipal, to carry out the plan.

For the doctor to receive part of his salary as a fixed payment from the State was the first step to a full-time medical service. Indeed, Mr. Law pointed out, the Socialist Medical Association had stated that the present proposals in regard to payment fell short of the policy they advocated, and they still insisted that "the best service, the perfect doctor-patient relationship, and the highest form of team-work, will be possible only when the service becomes one employing whole-time salaried officers." Mr. Law urged that it was better that the material prospects of the doctor should depend upon the impression he made on his patients rather than on the impression he made on his administrative superiors. The bad effects of the Bill might not be seen for 15 or 20 years, and by then it would be too late to do anything. If the House passed the Bill they would be taking a step from which there could be no going back.

In a maiden speech Dr. L. COMYNS thought that much of the adverse criticism by the profession was based on lack of information or on wrong information. He regretted that the leadership of the profession had failed to keep abreast of public opinion.

Speaking anatomically, Dr. R. CLITHEROW described the Bill as a skeleton. The master brain controlling the nervous system was in place in the skull well protected by the hard bony majority possessed in the House; the nerve tracks were in position to move the future muscles and covering, to be supplied at a later date by regulations; the intestines were ready to accept, digest and absorb, or reject whatever might be offered. He urged the Minister to provide a full maternity hospital service for those who desired it, with clinics controlled by the obstetrical hospital team, leaving the domiciliary cases for the local authority to control and to provide with a midwife nursing service.

Mr. R. SARGOOD asked the Minister, before he finally decided on the form of a regional board for London, to consult the representatives of the London municipalities. Arrangements that might be straightforward in other areas might not be applicable to London. He suggested the setting up of an organisation for the bulk purchasing of supplies for the hospital services. The continuance of mental institutions run for private profit was surely as deplorable as private nursing-homes, and he urged the Minister to find a better way of safeguarding the liberty of the subject than by continuing the Board of Control.

Miss A. BACON welcomed the Bill as giving to thousands of people freedom to consult a doctor or specialist without thinking of the cost. She feared that the proposals for paying patients would go further than the provision of privacy, and that it might be easier, as it was today, to enter a hospital as a paying patient than through the normal channels. Though the number of public patients a doctor could accept was limited, there seemed to be no limit to the number of his private patients, and she feared this might be open to abuse. In a State theatre the seats might have different prices, but we could not afford to have any second-rate seats in an operating-theatre. It would be doing doctors a disservice, she thought, to say that all of them opposed the Bill. The Leeds branch of the B.M.A. had supported nearly all the proposals in the Bill, including those on the sale and purchase of practices, the public ownership of hospitals, and their organisation on the regional basis. Leeds, she believed, was regarded as one of the black spots of the B.M.A., which was perhaps discovering that it had more black spots than was thought.

Sir JOHN GRAHAM KERR, F.R.S., speaking as a teacher, pointed out that the future of any medical service depended upon the quality of the recruits to the profession and the perfection of the training. No doubt some students were attracted by the high ideal of ministering to the sick, but the ordinary student was attracted by the glamour of the prizes open to him—comparative wealth and dignity, and the possibility of high honour. These young men would not be attracted by the principle of safety first, and salaries, and promotion by age.

Mr. A. W. J. GREENWOOD contended that the human atmosphere of a hospital depended upon the personality of the medical and nursing professions and not on its ownership.

Sir RALPH GLYNN, though he disliked various things in the Bill, believed that they were all points capable of moderation or adjustment. The remarks of the Minister had fortified him, for he thought Mr. Bevan had spoken with a great sense of responsibility. Party views, Sir Ralph held, should not be brought into a matter of this kind where we stood at the crossroads of something which was far more serious than any party

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question. If ever there was a case where there should be coöperation between people for the good of the country it was in regard to the health of the people.

In welcoming the unification of hospitals, Dr. H. B. MORGAN urged the claims of special hospitals such as the Quakers' Retreat at York. He had heard that the Royal Masonic Hospital was prepared to turn itself into a nursing-home rather than be included in the scheme. Would the Ministry of Pensions' hospitals be taken over? He regretted that industrial medicine had been left out of the Bill. Dr. Morgan admitted that no man worth his salt, trained in true medicine, could but feel deeply when his profession was involved, but he saw nothing in the Bill that would disturb the great relationship between the profession and the public. When he heard the petty criticisms made by some of his colleagues he realised that some of his profession were so keen about their work, their livelihood, and their economic interests that they wanted to see the problem not through a telescope but through a microscope. So far no Government medical service had been a success, but he pictured the new medical services working on different lines. With democratic regulations, consultative committees, a good Minister, good administration, and a good department we could build a fine service which would redound to our credit down the ages.

Broadly speaking, Mr. F. MESSER thought there were two types of social service. The mechanistic—such as water and electricity—affected people in the mass, and provided they were efficient it did not matter who administered them. But the human social services, such as education and health, affected the individual, and there, not only what was done mattered, but also how it was done. The Minister had in effect said, "I am the final arbitrator in deciding who shall man every stage of the administration." The national health service council would be the advisory and planning body, and Mr. Messer thought it right the Minister should choose his advisers. But on the lower level of the regional board surely there was something to be said for a representative body. Why this loss of faith in the elective principle? On the whole Mr. Messer gave the Bill his blessing, with the qualification that it could be better, and by the time the final stages were reached he hoped it would be better.

Second Round

For those who believed in nationalisation, Sir HENRY MORRIS-JONES, M.R.C.S., thought the Bill was a good one, but he himself believed that no industry, and certainly no profession, was improved by it. It was unfortunate that the Spens report was not yet available, because no-one knew the terms of service on which practitioners would have to work under this Bill. The Minister had laid more emphasis on capitation than on salaries, and Sir Henry urged him to drop the salary proposal altogether. The suggestion of a diminishing capitation fee made in the white-paper was dangerous, for people who came in under the lower figure would be a separate category from the main body of the doctor's patients, and might be considered small capitationists. The Minister, Sir Henry insisted, was also wrong on the sale of practices. A medical man, like any other professional man, had a right to sell his practice, which was the fruit of his endeavour and represented the goodwill which he had built up. Nobody could quarrel with the amount of compensation offered, but the doctors were against compensation altogether. They preferred to retain their practice asset. Compensation would in a sense be a forced loan, for though the doctor would receive interest on the money for the rest of his life, or until he retired, he had no control over his own capital.

The Minister's figures on the distribution of doctors were fallacious. Sir H. Morris-Jones thought on the whole it was fair. When all was said and done there was a law of supply and demand. In conclusion he expressed misgivings about the Government's proposal to take over sickness as a national matter. He was afraid of the dull uniformity which ran through the whole of this scheme. It might very possibly become a utility scheme, under which doctors would treat and cure less and less, while signing and certifying more and more. Everyone agreed with the aim of the Bill, to bring about a comprehensive health service, and if Mr. Bevan would accept amendments to do away with this diabolical direction of doctors, to give those who had to work the scheme a greater share in its administration, to encourage more interest in voluntary and local hospitals, by allowing them greater control over their finances with less central direction, and if he could create a general-practitioner service comprising people who would work happily and with enthusiasm, then even this Bill might be made workable.

A MINISTRY SPOKESMAN

In his speech Mr. C. W. KEY, parliamentary secretary to the Ministry of Health, asserted that no efficient hospital service could be provided if the units had the power to determine their own functions within a so-called system, or to decide the extent to which they would participate. The Government were not standing for the claim that while it was right to conscript the labour and lives of men in a war against evil abroad it was wrong to conscript buildings and institutions in a war against disease at home. He denied that the proposals of the Bill would destroy the local spirit, the local character, and the local interest in hospital services. Every hospital or group of hospitals would have its own committee of management, not black-hearted black-hatted bureaucrats from Whitehall, but appointed by the regional board of the area after consultation with a number of local authorities, including the local health authority, the local executive committee in charge of the practitioner service, the existing voluntary hospitals, and the senior professional staff in the hospitals themselves. Could there be a more local body than that? The present local-government administrative machine, Mr. Key was sure, could not provide a properly planned and administered hospital service, for it had not kept pace with developments in communications and transport.

General practitioners, Mr. Key contended, were free to choose the form, place, and type of work which they preferred, and would remain so. That some control of the distribution of doctors must be established was obvious. The B.M.A. claim that every registered medical practitioner should be entitled as a right to participate in the public service was impossible and impertinent. No class of public servants had that right. The interests of the community demanded that the distribution of medical services should be organised in accordance with the needs of patients and not the whims of practitioners as the guiding factor. No-one wished to destroy the freedom to choose and change a doctor, and in so far as freedom of choice existed it would go on. But for many people that freedom had never existed, and we had to ensure that what in actual experience was largely a pretence was not used to frustrate the foundation of a real medical service. The fundamental relationship between doctor and patient would remain what it was now, with the great difference that patients would not pay fees for attention. The resources of the community would be pooled and doctors would be paid for general care irrespective of individual needs.

As to the sale of medical practices, Mr. Key asked if this was right for doctors why should it not also be right for others whose incomes were guaranteed from national funds, such as medical officers of health, school teachers, health visitors, and sanitary inspectors? The number of doctors on which compensation was based

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was 17,900. The Government had not proposed to make the medical service a salaried service because the medical profession was not yet ripe for such a service; the secretary of the B.M.A. in a letter to the *Times* on April 17 had said that a salaried medical service "might tend to replace competition for patients by competition to avoid them." A more important reason was that a full-salaried service was inconsistent with the free choice of doctor to which the Government had agreed, for it would make inevitable the compulsory allocation of work, that is, distribution of patients among doctors. Therefore they had put forward the compromise of part basic salary and part capitation fee. He saw no reason why, with good will on both sides, they should not be able to settle the general rate of remuneration when the Spens report was issued.

Doctors would not be allowed to charge fees to patients on their own lists, but a patient who wanted the opinion of another general practitioner—not, of course, a specialist who is available within the service without charge—would have to pay for it. Dealing with private patients and pay-beds in hospitals, Mr. Key said that the Government felt that to prohibit private practice to doctors joining the National Health Service would only, at any rate to begin with, keep out of the service many good doctors who would otherwise have joined. It was objected that the Government were making special provision in hospitals for privileged patients who could afford to pay for private accommodation, a practice alien to a real public social service. But he could assure the House that if any patients on medical grounds needed special privacy, such accommodation whenever available would be provided free of cost as part of the normal service. But when private rooms were available and were not needed on priority medical grounds it was proposed that they should be open to people who were willing to pay for this extra amenity. At present specialists' work, particularly in voluntary hospitals, was usually honorary and naturally they grouped themselves in areas where paying private practice predominated. Apart from their private practice advice and treatment from them could be obtained only at certain hospitals—all too limited in number—and it was practically impossible to get the specialists into the patient's home. The Government wanted the specialists to assist in their hospital services widely over the country, but they must prevent specialists who were giving part-time to the services from putting in a minimum routine attendance at the hospitals and then rushing off to deal with their private cases in a private nursing-home. They wanted to encourage the specialists to regard the hospitals more and more as their professional bases and for that reason they were certain that it would be best—on the distinct understanding that the needs of the ordinary service were fully met—to allow specialists to bring in some of their private work to pay-bed blocks.

The Bill placed no obligation on any doctor. He might stay outside the service, or he might come in with his present practice. He was free to refuse any patient, for not only did the patient choose his doctor but the doctor chose his patient. It increased the responsibilities of the local authorities, for their optional powers to provide care for mothers and young children, health visitor and home-nursing services, ambulances, and health centres all became duties. He was convinced that it would do more than any other measure to lift a load of care and worry from our people.

THE FORMER INCUMBENT

Mr. H. WILLINK, the late Minister of Health, on behalf of the main Opposition moved the following amendment:

> "That this House, while wishing to establish a comprehensive health service, declines to give a second reading to a Bill which prejudices the patient's right to an independent family doctor; which retards the development of the hospital services by destroying local ownership, and gravely menaces all charitable foundations by diverting to purposes other than those intended by the donors the trust funds of the voluntary hospitals; and which weakens the responsibility of local authorities without planning the health services as a whole."

Health, he agreed, was not a matter for political controversy, if it could be avoided, but with the Labour Party's declared view, that "it is necessary that the medical profession should be organised as a national, full-time, salaried, pensionable service" the Opposition were in total disagreement. Was it, he asked, still the policy of the Labour Party? Socialist Ministers—his colleagues and seniors in the Coalition Government—had in the white-paper declared their abhorrence of this principle, and affirmed that the sense of personal association associated with family doctoring must be preserved. Yet Mr. Willink thought it was endangered by this Bill. The Coalition Government in the white-paper had said that it was not their wish to destroy or diminish the voluntary hospital system. What was this baleful influence of the Minister of Health which had overthrown those more experienced opinions? When the Minister sent for representatives of the voluntary hospitals did he in fact say to them: "I am not prepared to discuss the extinction of the voluntary hospital system"? If so, it seemed a monstrous way of treating bodies which had been promised that they should survive in undiminished vigour. The same attitude was adopted with representatives of the medical profession and the local authorities.

Personal health services, he held, should be planned over areas far smaller than Mr. Bevan's regions; such areas could have a life of their own, and yet have the full help of the universities. The non-elective regional boards seemed to him regionalism at its very worst. The men they wanted to plan and guide a service would have neither the time nor the inclination to administer a huge organisation stretching perhaps from Bristol to Lands End. Objecting to the pooling of endowments he pointed out that with a developing service there would be use for them everywhere. The unevenness of finance in different counties could, as in the Education Act, be met by varied contributions from central funds.

Examining part IV of the Bill Mr. Willink said that apparently regulations could be made introducing a full-time salaried service. He was unimpressed by Mr. Bevan's examples of so-called "over-doctored" places and he was sure that the risk of maldistribution was not sufficiently great to justify setting up this most unsatisfactory machinery with a large addition to the criminal law and an expenditure of £66 million. He was surprised that the Minister could put forward the idea of a central Medical Practices Committee with a serious face. Would the five doctors remain in "active general practice" for long if they were to decide the succession to every practice? Dr. HADEN GUEST interposed that the decisions of the Central Medical War Committee were made in that way, but Mr. WILLINK disputed the comparison, saying the C.M.W.C. had done its work with 145 local committees. The Medical Practices Committee would need a staff of 40 or 50 civil servants after the scheme had been started. Mr. BEVAN pointed out that the number of doctors to be appointed would be under 1000 a year. In fact the local executive committee would appoint them, and they would be referred to the Medical Practices Committee solely on the ground as to whether the particular area was under-doctored or over-doctored.

In conclusion Mr. WILLINK said that the fundamental objection to the general practitioner set-up lay in the matter of salaries. He had never heard more flimsy reasons for something which the Minister knew was obnoxious to the medical profession than the three

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which Mr. Bevan had given for this basic part-time salary. There was no reason why the profession should become part-salaried except as a concession to Socialist doctrine.

Points of View

Mr. CLEMENT DAVIES was surprised that no reference had been made to the fact that Wales already had experience of a regional board. The National Memorial of Wales, now a Government institution, was the envy of all the English counties, and more research had been done under it than anywhere else. It was financed partly by the Government and partly by the county councils, but that had not prevented the people from making contributions to the local sanatoriums.

Mr. A. L. UNGOED-THOMAS regretted that the private-fee system had been allowed to remain. There was scriptural authority for winking at minor transgressions. This, however, was not winking, but Willinking.

Mrs. F. K. CORBET, in a maiden speech, said that the London County Council had given up their system of hospital services only because of their enormous desire for a comprehensive health system throughout the country.

Mr. SOMERVILLE HASTINGS, F.R.C.S., pointed out that the Bill could not be looked at in isolation. It was part of a broad scheme for ironing out some of the uncertainties and inequalities of life. One of the main claims on the new National Insurance Fund would probably be for sickness, so it was up to the Minister to do all he could to prevent and cure sickness. Contributions everywhere were to be equal, and it followed that the Minister must provide everywhere an equally good service. The only alternative to taking over the hospitals was to try to control them by monetary grants, but Mr. Hastings doubted if a powerful authority or a well-endowed institution could be induced to toe the line by the withdrawal of a grant. His experience with the L.C.C. had shown him the advantages of hospital unification. Supplies could be purchased in bulk, equipment standardised, patients and staff easily transferred in an emergency, and opportunities for specialisation and research widened by the segregation of patients. The suggestion made in recent letters to the *Times* for granting more power to hospital management committees struck him as dangerous. Anything that would limit the far-sighted planning of the regional hospital boards or the influence of the universities and teaching schools would be a real disaster. He was aware that to secure the right people for the committees they must be given a good deal of power. They must have power to spend a certain amount of money, to make rapid decisions, and to experiment; but their power must be strictly limited. If they had the power to appoint doctors and senior staff they would, he feared, be liable to follow the voluntary hospitals into that inbreeding which had been the curse of the system. He did not see why local interest and pride in a hospital should not be developed under a national system. However good public provision might be there would always be opportunity for voluntary effort and for experiment in social service. A strong case, he thought, could be made for permitting payment for privacy, but payment for treatment was different. Speaking from personal experience he was sure that on the staff of his teaching hospital he and his colleagues did as good an operation for their public as for their private patients. But he was equally sure that they paid more visits to their private patients and left the care of their hospital patients much more to their registrars and house-surgeons, and in so far as the senior staff were more experienced than the juniors he supposed that the patients in the private wards were actually getting better treatment. In any case he was certain that those patients believed that they were getting better treatment. It would be the same in the national hospitals, and he felt that it was most undesirable. Admittedly it was convenient for doctors to have their public and private patients under one roof, but important as the doctors were, the patients were even more important.

Lieut.-Colonel C. H. GAGE thought the diminishing capitation fee wrong in principle. He also opposed the payment of fixed salaries. Instead, to attract doctors to areas of scattered population, could not the capitation fee be raised? A salary was defended as giving security to young men starting in the profession, but surely security was for the old? He had always felt that it was the very insecurity of the profession that attracted the adventurous young man with initiative. Why not retain the purchase and sale of practices and use the compensation money to provide the young man with security when he really needed it, in the form of scholarships before he qualified?

Dr. HADEN GUEST said that the two main provisions of the Bill were a complete hospital service and a personal medical service for people of all ages, insured and uninsured. That was the foundation of a future building which could be extended as our resources and knowledge grew. The recent Hospital Surveys had provided an important body of facts drawn from all over the country on which to base our conclusions instead of general opinions, and the coördinated hospital plan arose from the logic of the facts. Dr. Guest quoted passages from the surveys for London and the south-western area, giving instances of lack of coördination of hospitals, of maldistribution of specialists, and of shortages of beds. In small hospitals failure to keep adequate case-notes was recorded, midwifery accommodation was often unsuitable, and the chronic sick seriously overcrowded. During the war, he pointed out, despite the shortage of doctors and specialists, by coördinating the work of the voluntary and municipal hospitals we had created the Emergency Medical Service which saved us thousands of lives and hundreds of doctors. The Central Medical War Committee—mostly members of the B.M.A.—"and we must say a good word for the B.M.A. sometimes"—was doing valuable work, while the Medical Personnel Priority Committee, of which he was chairman, undertook the general work of allocation. He would like to see a central medical peace committee, and he appealed to the House and to the medical profession to help to coördinate our hospitals not for war casualties but for the casualties from tuberculosis. To add to the attractions of the scheme for men of vigour and adventure Dr. Guest was anxious to make the new service as wide as the British Commonwealth of Nations. Medical officers in the Colonial Medical Service should be interchangeable with medical officers of the national service of this country. Doctors in this country should have the opportunity to visit the Colonies and Dominions and return enriched by their experiences. "We are organising," he ended, "something more than a National Medical Service. It is nothing less than the turning of the knowledge and wisdom and practice of the medical profession, and of all the sciences on which it rests, to the service of our common humanity."

Mr. WILSON HARRIS thought that the lot of the ordinary general practitioner would in many respects be made easier by the Bill and in only a few respects more difficult. Some of the profession's hostility, he suspected, was psychological. In accordance with the traditions of Parliamentary draftsmanship the executive authority of the Bill was invariably referred to as "The Minister"—that meant in effect "the Ministry"—and how much less disturbing it would have been to use the second word, for it was a hard but painful fact that the forceful and occasionally provocative personality of the present incumbent of that office had not evoked from the medical profession

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precisely that whole-hearted admiration which he no doubt desired and deserved. It could be understood that an agitated medical practitioner working conscientiously through the Bill and finding on every page a reference to the Minister might exclaim with some vigour "that man again." Speaking as one who was attached to no party he was disappointed that at its second reading this great measure should not have the support of a united House.

Captain J. BAIRD, L.D.S., submitted that it was necessary to bring the voluntary hospitals into the scheme because they were facing bankruptcy and because we could only get efficiency under a new system. He asked for recognition of the dental surgeon's partnership with the doctor in the medical services of the country. Today a dental officer employed by a local authority could usually only approach his medical committee through the senior medical officer.

THE MINISTER'S POWERS

Colonel M. STODDART-SCOTT, M.D., thought that time alone would show whether this Bill was a good one or a bad one. He found it curious that in a measure which coerced the medical profession, the hospitals, and the local authorities the Minister was not prepared to coerce the general public by insisting that vaccination should remain compulsory. Nor had Mr. Bevan accepted the suggestion made again and again by the profession that the Minister of Health should devote his whole time to the health of the community and not spread it over housing and other things. Mr. Bevan had offered no reason for the diminishing capitation fee and Colonel Stoddart-Scott himself did not see why it should be a case of one for a penny and three for twopence. The buying of practices had never been a financial burden round the neck of the young man. The real bottleneck which prevented people from becoming doctors was the cost of medical education. The Bill gave great dictatorial powers to the Minister—greater, he thought, than the Minister either desired or needed. Under clause 43 the Minister could send to any part of the country an unqualified man to practise medicine, and it was possible for the Minister to displace a doctor and send an unqualified man in his place. Again under clause 35 he could prosecute a doctor years after he had left his private practice and come into the State scheme if he sold his house or surgical instruments to another doctor. Under clause 34 (9) even a son who followed his father was precluded from making any financial assistance to his father or mother. Colonel Stoddart-Scott regretted that local health authorities had the statutory duty to set up health centres without some overhead body, such as the regional board, deciding where the centres should be established. Once it became necessary to introduce large weekly National Insurance contributions the 2*d.* and 3*d.* a week of the voluntary hospital system became impossible. But was it necessary because the Government financed a hospital or institution up to 100% for them to own and not just control it?

Sir ERNEST GRAHAM-LITTLE, F.R.C.P., said he had opposed the proposals of the Coalition white-paper, but his opposition to the Bill was stronger. He opposed it because the medical profession, and especially the consultant section for which he was most qualified to speak, were overwhelmingly resistant to it. The nationalisation of hospitals was nowhere mentioned in the programme of any Socialist candidate and the country had given no mandate for this measure. The voluntary hospital was the life of the consultant. It attracted to its service men and women who were deeply interested in the scientific practice of medicine and in research because it offered freedom. With this Bill that freedom would vanish. Nationalisation of hospitals would cause mortal injury to the prosecution of medical research which for the last hundred years had come almost exclusively from the voluntary hospitals. One of the gravest reproaches against the Bill was its ludicrously meagre reference to research. Nine lines in clause 16 dealt with research, while 140 lines in clause 35 were devoted to devising savage punishments for the doctor who wished on his retirement to introduce to his patients a successor to his practice, and who accepted a modest premium for exerting that good will.

Mr. R. R. STOKES asked if the Catholic hospitals could be given the same rights and guarantees under the Bill as the teaching hospitals. They did not resist the supervision of the regional committees but asked that their atmosphere and character might be maintained. Wing-Commander E. R. MILLINGTON reminded the doctors that for the first time they were being offered "participation." In most hospitals they were at present not directly represented on the finance committees; now they would share the responsibility of allocating funds.

Government Reply

In summing up, Mr. ARTHUR GREENWOOD, Lord Privy Seal, declared that Labour policy was never final. It was a developing policy, and as soon as the Bill was on the statute-book the Minister of Health would, in collaboration with the medical profession and with the hospital authorities, establish a partnership to work out in detail how this great measure was to operate in the years to come. He thought many of the speeches of the Opposition an insult to the medical profession. In effect it had been said that unless doctors were allowed to buy and sell practices like hucksters in the market-place, and unless they could retain their private enterprise, they were not going to be good public servants. He did not believe that. It was the Minister's intention before prescribing terms of service or rates of remuneration to use the familiar machinery of discussion and negotiation with employees. Where no such machinery existed he intended to set up some machinery of the Whitley council type behind which there might be provision for agreed reference to arbitration should the Whitley council not be able to carry it out.

Turning to points raised in the debate Mr. Greenwood assured the House that where hospitals had any particular denominational background it was intended to preserve the character of the institution. The Bill provided for the possibility of voluntary nursing associations being used in the home nursing service, and the Minister proposed to discuss their training and supervision with the nursing profession as a separate problem at the earliest opportunity.

Division and Committee Proceedings

The second reading of the Bill was carried by 359 votes to 172. Mr. Churchill's motion that the Bill "be committed to a Committee of the Whole House" was rejected by 344 votes to 180, and the Bill was committed to a standing committee.

Speaking afterwards in committee on the National Health Service (Money) Mr. BEVAN said it was obvious that taking over the hospitals from the local authorities must mean the revision of the block grant, and he would start discussions with the local authorities almost immediately to try to reach a new formula. It had been asked what would happen to the voluntary hospitals in the meantime. One of the inevitable consequences of a measure of this sort was an interregnum between the passing of the Act and the establishment of the new service. He hoped that all those concerned with voluntary hospitals would maintain their exertions. He imagined that weekly contributions would be paid until they were no longer necessary, and he trusted that the contributions of the public would be kept up to enable the services of the voluntary hospitals to be maintained at the highest possible standard.

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Medical Conferences

THE PANEL CONFERENCE

NATIONAL HEALTH SERVICE

REPRESENTATIVES of local medical and panel committees met in London on April 30, with Dr. J. A. BROWN (Birmingham) in the chair. With minor modifications they approved the B.M.A. council's report on the National Health Service Bill, presented by Dr. E. A. GREGG, chairman of the Insurance Acts Committee. They also passed a motion approving the establishment of a comprehensive health service for England and Wales.

ADMINISTRATION

Dr. F. M. ROSE gained a large majority for the motion by Preston that in the new service beds should be supplied, either in special wards or in hospital, where general practitioners could undertake the full care of their patients. It was only in recent years, he said, that the hospital had become the domain of the specialist. There was a danger of the general practitioner's field being narrowed to the treatment of lesser ailments and the diagnosis of major ailments. A further motion from Preston—that all hospital boards of management should include representatives of the local general practitioners—was supported, nem. con.

For West Suffolk, Dr. N. STEVENS put a motion calling for liaison between the local executive council and the regional hospitals board. The feeling in his area was against regional authorities, which were more impersonal and less fully aware of the individual difficulties of the individual doctor than local bodies. The motion was carried.

The meeting agreed with Dr. J. A. IRELAND that publication of the reports of the Central Health Services Council should be ensured. Cheshire called for the appointment of medical members of this council, and of the standing advisory committees, and the Medical Practices Committee, by election. Dr. H. GUY DAIN, chairman of the B.M.A. council, pointed out that direct election would cause difficulties alike for the Minister and the profession; nevertheless, the Minister should seek the profession's approval for his appointments. Dr. H. S. HOWIE WOOD agreed with Dr. Dain; but, he added, the Minister should have no power of veto. Dr. W. JOPE sought an assurance that the Minister proposed to consult the B.M.A., rather than other bodies, when seeking agreement on the personnel of committees at all levels. In answer, Dr. DAIN read a letter from the Ministry of Health, stating that the Minister would be willing to discuss the Bill with the Negotiating Committee after the second reading. Dr. JOPE held that this was no reply to his question, and Dr. DAIN admitted that no undertaking had yet been given by the Minister. The Cheshire motion was carried.

The comments on hospital ownership in the B.M.A. council's report were accepted, and a rider was added that the special Representative meeting should be informed that the conference considered it essential that voluntary hospitals should retain control of their property, assets, and invested funds.

HEALTH CENTRES

Dr. A. B. DAVIES, for Staffordshire, Walsall, and Stoke-on-Trent, argued that at the outset health centres must be on an experimental basis only. He had a dark vision of the future with direction, direct or indirect (cries of No!), and of doctors working in premises other than their own, with no control over the nursing or clerical staffs. No diagnostic facilities, he said, had been included in the plans for centres; and there was no provision for other types of opinion. Health centres would simply concentrate the practitioners. Were not doctors liable to be evicted from these publicly-owned premises? If so, where could they turn? It was true that doctors could continue, for the moment, to work in their own surgeries; but this was simply a matter of expediency for the Minister, who could not hope to operate the Bill without the use of them. Where was the doctor to practise after he had been bought out? And what of the freedom of the patient? When a doctor died, his surgery would be closed and patients would be allocated to doctors in health centres.

Dr. Davies was reproved by Dr. DAIN for his "defeatist attitude," which suggested that the B.M.A.'s view would be held in no regard.

Dr. W. LIVINGSTONE suggested that the disadvantages of the proposed centres were that they were to be built, equipped, and staffed by the lay authority; they were to be administered in rigidly demarcated local-authority areas; and the system was a half-way development towards the whole-time State medical service, into which it would be easy to slip.

Dr. A. HAMILTON contended that centres should be established only by agreement with the association in the area.

Dr. A. BEAUCHAMP suggested that centres should be first developed in congested areas, thus helping to attract doctors to districts where they otherwise preferred not to practise.

Dr. A. TALBOT ROGERS spoke in favour of health centres. Shortage of labour and material would automatically limit construction; what he feared was that no centres whatever would be built for a time, and that when conditions became easier the Minister might call for their wholesale construction without proper experiment. Prototypes, he claimed, should be erected now.

Dr. D. L. S. JOHNSTON saw danger in the ownership of centres by local authorities; the profession should establish experimental health centres on its own initiative. Under the terms of the Bill, the doctor would be worse off, since he would be running two concerns—one at his own surgery and the other at the centre.

Dr. H. H. D. SUTHERLAND suggested that the B.M.A. might construct health centres, to include pathology, radiology, and physiotherapy departments. A vote was taken, and Dr. Davies's motion was carried.

BUYING AND SELLING OF PRACTICES

Dr. GORDON WARD found the Minister's offer for the purchase of practices tempting, especially as, in a few years, there might be no buyers. Dr. DAIN indicated there there would be ample time to decide about the disposal of practices between the enactment of the Bill, at the end of the current session, and its implementation at the beginning of 1948. £66 million had been offered in compensation, but this would not be paid in cash, since it was officially considered that the sudden release of this sum would disturb the country's economy. Claims by those who had borrowed money for the purchase of practices would be considered, but otherwise the money would be forthcoming only on death or retirement; until then interest at the rate of 2¾% would be paid.

Dr. J. A. PRIDHAM pleaded for the large view; doctors should not consider themselves individually. Dr. S. WAND suggested that Dr. Ward valued his liberty less than the Barbarians of the North, who were willing to lay down their lives rather than loose their freedom. A Scots representative intervened to inquire the scope of "North" in relation to Barbarian, but Dr. Wand stood his ground—North Britain was not excluded. Dr. ROSE took liberties with architecture in his suggestion that this plan for compensation, together with direction and payment by basic salary, formed the three legs to the tripod which supported the concrete foundation of the Government's proposals for a salaried service; all three provisions could be met by other methods.

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Dr. LIVINGSTONE, voicing for Staffordshire, Walsall, and Stoke-on-Trent a motion that there should be no interference with the buying and selling of practices, saw indecision and disunity as the dangers to the profession. Politicians, it was said, considered the opinions of the present generation, whereas statesmen had regard only for the future. Doctors must be medical statesmen, and unite behind the Negotiating Committee. Other speakers called for unity and the defence of freedom. The motion was carried without dissent.

From Kent came a resolution deprecating the clauses in the Bill dealing with the sale of goodwill, and the savage and misdirected penalties for their infringement. Dr. C. M. STEVENSON said that the Bill offered no facilities for assistants or partners; the aim was apparently to drive everyone into the health centres. Opportunities for group practice outside the centre were needed, especially in rural areas. The motion was carried unanimously.

Dr. C. P. PORTER proposed a Worcestershire motion that doctors should have the option of joining the service within six months after the appointed day, without loss. Nothing, he said, was yet known of the conditions of service; the profession might be jockeyed into a difficult position and be unfairly penalised. The meeting passed to the next business without a vote.

Reading won approval for a motion that the introduction of a comprehensive service in 1948 would be premature owing to lack of personnel and buildings. Dr. F. E. GOULD suggested that surgery accommodation, already insufficient, would be still more inadequate with a 100% service; doctors could not be expected to improve their surgeries if, when the time came, their houses were to be sold as purely private buildings.

DISTRIBUTION AND REMUNERATION OF PRACTITIONERS

A motion by Dr. R. W. RAE (Staffordshire) that there should be no direction of a practitioner regarding the area in which he was to practise was carried unanimously.

Dr. J. BECK, for Glasgow, advanced a motion that payment should be by capitation fees only. He suggested that payment by large capitation fees and a small basic salary was the thin end of the wedge at whose other extremity lay basic salary only. The motion was carried with one dissentient. A further motion, this time from Staffordshire, that payment should be by standard capitation fees won unanimous approval.

From Kent came the proposal that doctors might be given the choice of payment either by salary or capitation fees. This evoked an impassioned reply from Dr. BECK, who held that doctors must be inspired by capitation fees. The motion was rejected by an overwhelming majority.

PRINCIPLES

Sheffield submitted that the Bill should ensure that a person who chose to be a private patient of a practitioner should not thereby deprive himself of hospital, consultant, and other benefits in the scheme; and that the certificates of such a practitioner should be valid for all purposes. The meeting unanimously agreed.

It also accepted unanimously a Midlands motion that the Bill infringed the seven principles laid down by the Negotiating Committee, which principles the meeting approved. The representatives believed that the Bill, in its present form, would inevitably lead to a whole-time salaried service, and decided to support the B.M.A. in any action it might take to secure the necessary amendment.

APPEAL TO THE COURTS

The meeting agreed to a Kent motion that the proposed disciplinary tribunal was unsatisfactory so long as there was no appeal from its decisions to the courts of law. Among the points made by speakers were the inadequate medical representation on the tribunals, which are to include only one doctor, and the denial of ordinary civil rights by the failure to provide for appeal in the courts against the Minister's decisions.

The conference also agreed to regard as unacceptable any regulations or contracts for service which did not provide, in case of dispute between the profession and the Minister, an ultimate right of appeal to the courts.

PENSIONS

Dr. H. W. POOLER (Derbyshire) spoke for senior practitioners, who, he suggested, might suffer hardship if compulsorily retired. Dr. GREGG said that this had no place in relation to the day's business, and the conference proceeded to consider a last-minute motion that the B.M.A. should frame an alternative service to that of the Government, for presentation to the public. This also failed.

B.M.A. GUARANTEE FUND

After discussion the conference decided to recommend the trustees of the National Insurance Defence Fund to double its guarantee of £100,000 to the B.M.A. Guarantee Fund.

BRITISH MEDICAL ASSOCIATION

SPECIAL REPRESENTATIVE MEETING

THE association's representatives met at B.M.A. House on May 1 and 2 to consider the council's report and statement of policy on the National Health Service Bill, Dr. J. B. MILLER being in the chair. Dr. J. HUNTER, of New South Wales, brought a message of encouragement to the association in its fight for professional freedom.

Before the meeting got down to business it spent some time considering a suggestion by Dr. W. N. LEAK (Mid-Cheshire) that the resolutions dealing with the general attitude of doctors to the Bill should be taken first, so that Parliament and public would be left no longer in doubt. Whether by accident or design, he said, the Government had opened the second reading of the Bill before the representatives had completed their discussions, and the press were still saying that the profession was in general agreement with the Bill. Dr. Leak's suggestion had its supporters, but Dr. PETER MACDONALD, the immediate past-chairman, called it a waste of time, and it was decided that Parliament, public, and press would not suffer if left uncertain about the attitude of the representatives until 11 A.M. next day.

Dr. J. A. BROWN (Birmingham) having reported that the Panel Conference held the day before, representing 18,000 general practitioners, was solidly behind the council, Dr. H. GUY DAIN (Birmingham; chairman of council) moved that the council's report be approved. The Bill, he said, proposed to set up three separate services which the Minister pretended would work together. It put the Minister in the position of a complete dictator (applause); 29 clauses gave him power to alter its provisions at will. It gave the Minister a hospital monopoly, so that he could suppress any new hospital starting outside the service. It would do away with trusts set up by benefactors now dead. Abolition of the sale of practices would make all existing partnerships and mutual agreements void, and though the Minister had for years been preaching the advantages of group practice the Bill set up such savage penalties that no-one would dare to make new mutual agreements. Whatever might have been the views of doctors when they answered the questionary circulated in 1944, very few would vote for payment by salary now that its implications were realised. The Minister had said that he had no intention of making doctors civil servants; but if he paid them by salary there would be very little difference. It was up to the profession to see that they could not be made civil servants. The association did not expect to influence

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Parliament in any way—with the Government's strong majority the Bill was certain to pass—but the council were preparing amendments to be presented at the committee stage of the Bill. Success depended on the solidarity of the profession and the influence of patients on M.P.s. The Bill might become an Act this summer or autumn, and Jan. 1, 1948, was suggested as the "appointed day." In that interval the association must take its share in preparing regulations for working the Act. Then doctors would be asked to decide individually whether they were willing to serve in the scheme set out in the Act plus regulations. The council would be meeting the Minister next week, and would tell him: "You want a good service; we want a good service. You want doctors; we have the doctors."

When the applause had died down the representatives embarked on the hundred-odd amendments to Dr. Dain's motion, starting with part A of the council's report, the Seven Principles of the Profession.

Dr. J. A. GORSKY (Westminster), in the first and last attempt at oratory in the meeting (thereafter speeches were limited to 10, 5, and ultimately 3 minutes), emphasised the importance of free choice as laid down in principle III. Not only should the citizen be able to obtain his medical care privately but the arrangement should not be such as to penalise him or his doctor if he did. Facilities should be provided in hospitals for treatment by private practitioners and specialists. Under clause 71 of the Bill the Minister could act without the agreement of Parliament—a contravention of the spirit of the British constitution which must inevitably lead to dictatorship. The Minister was trying to divide the profession. Specialists, a class which the Minister had not defined, would retain the legal right of all citizens to appeal to the courts, whereas general practitioners would lose that right.

Having agreed to a suggestion from Aldershot that pay and conditions of service must be good enough to maintain the status of the profession and encourage recruits, the meeting took Dr. Dain's tip and left the principles alone.

Turning to part B of the council's report, the representatives agreed, without argument, to amend its first paragraph to read:

> The Profession, while anxious and willing to coöperate with the Government in evolving a complete Health Service, is opposed on grounds of public interest to certain important features of the Government's proposals which render the Bill, in its present form, not only unacceptable to the Profession, but also constitute strong reasons for advising the Public against its acceptance.

FACILITIES FOR GENERAL PRACTITIONERS

Dr. J. M. CHRISTIE (Finchley) lamented the lack of any reference in the Bill to better diagnostic facilities, such as X rays and clinical pathology, for the general practitioner. Doctors were fearing that instead of getting more facilities of this kind they would get more forms to fill up. General practitioners should stake their claims now, and stake them high, or they might find themselves in a subsidiary position. This was agreed, as was the need for general practitioners to have ready access to ancillary services, such as massage and electrotherapy, and for a coördinated pathological service on a regional basis.

Dr. W. G. MURRAY-BROWNE (Gloucestershire) urged, and the meeting assented without much enthusiasm, that the family doctor should have the right to assume personal responsibility in hospital for patients which came within his scope, so being a respected member of a team rather than a mere signpost to the various departments.

REGIONAL OR LOCAL?

Dr. F. M. ROSE (Preston) favoured the Bill's form of local administration for general practitioners and regional administration for hospitals, an arrangement which the council sternly criticised. In his view the local committee system had worked well under N.H.I., and general practitioners should continue to be controlled locally. Dr. W. D. STEEL (Worcester) agreed, provided there was close liaison between the two; he did not like to think of doctors in Hereford being controlled from Birmingham, 50 miles away. Sixteen or twenty regions in the country could control hospitals very well, but would leave the G.P. in the air.

Dr. R. W. COCKSHUT (Hendon), however, would keep as far away from local authorities as possible; only at regional level was coördination possible. Moreover, he said, it would be a mistake at this meeting to pass any motion which approved of any sections of the Bill—a view which Dr. ROSE called pernicious nonsense. The meeting, said Dr. Rose, should approve of the good parts of the Bill and apply its efforts to condemning the bad parts. Dr. Rose then embarked on a short but sharp contest in repartee with Mr. LAWRENCE ABEL, the score being left at 2 cracks to 1 in Dr. Rose's favour.

Hastings and West Suffolk declared, more or less, for the Prestonites and local administration for G.P.s, whereas Furness and Liverpool preferred the Hendonian slogan of regional administration for all, and the Isle of Wight was for an all-regional plan everywhere except, perhaps, in the Isle of Wight; Worcester cautiously decided to wait until it knew what the regional hospital boards consisted of before making up its mind, and Finchley persuaded the meeting that the R.H.B.s should be called regional boards, since they dealt with other things besides hospitals. The meeting showed itself pretty solidly in agreement with the council in their preference for the regional principle.

CENTRAL ADVISORY MACHINERY

The meeting then turned to criticisms of the Central Health Services Council.

The first schedule to the Bill lays down that this council will consist of 6 ex-officio members and 35 others, of whom 15 will be doctors and the remainder persons with experience of hospital management, local government, or mental health services, dentists, nurses, a midwife, and pharmacists; the 35 will be appointed by the Minister after consultation with organisations that he recognises as representative of those persons. Mr. TUDOR THOMAS (Cardiff) wanted it made clear that the appointments would be made not only after consultation but also in agreement with the representative organisations concerned, and that this should be the principle of appointments to the other advisory committees. Mr. C. G. SCHURR (Brighton) moved that regulations under the Bill, with the exception of those concerning terms and conditions of service, should be made by the Minister in consultation and agreement with the C.H.S.C.; this was seconded by Mr. LAWRENCE ABEL and carried.

Dr. G. DE SWIET (Paddington) urged that the medical members of the C.H.S.C. should be elected by a secret ballot of the whole profession, but Dr. DAIN convinced the meeting that such matters were better left to the profession's representatives. The meeting agreed to a suggestion from Leicester that at least 8 of the 15 medical members should be in general practice.

There were several amendments objecting to the powers given to the Minister to prevent the annual report of the C.H.S.C. from being presented to Parliament if he thought its presentation would be contrary to the public interest. Dr. G. M. HOUSDEN (Hereford) could see that it might sometimes be unwise to publish a full report in war-time, but there was no point in making provision for such special circumstances in the Bill; the meeting agreed.

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HOSPITAL OWNERSHIP

In the anti-Bill atmosphere of this meeting, particularly after Dr. Cockshut's remarks earlier on, it needed some pluck to express approval with any part of the Bill, but Dr. VICTORIA SMALLPIECE (Oxford) was not deterred from moving:

That this Meeting approves State ownership of Hospitals provided that the constitution of the Regional Boards be acceptable to the Profession.

Most voluntary hospitals, she argued, have huge debts, and if they are to get the additional equipment they need and to pay their staff on the new scale their liabilities will rise still further; financial assistance from the Government is therefore unavoidable, and Government help must involve some Government responsibility. She believed that the regional scheme would provide a good service. This view was supported by Dr. G. NESBITT WOOD (Hastings), but it was soon clear that it appealed to only a minority of the representatives. Dr. COCKSHUT asked whether the State had ever been known to run a public service better than the people accustomed to running it. Anyone who sent his boy to a public school showed that he thought State schools inferior. Dr. J. M. CHRISTIE maintained that the taking over of hospitals by the State would destroy their homely atmosphere and pride in their own efforts and would lose them the support of the local community. Dr. J. C. ARTHUR (Gateshead) said that the Bill empowered the Government to take over every hospital and buy up every nursing-home, leaving the private practitioner unable to obtain hospital treatment for his patients. The Minister's policy was "divide and rule." Mr. DONALD WATSON (Bradford) described the removal of local ownership of hospitals as a stab in the heart of the people. Sentiment must always be kept alive in a hospital. Dr. F. K. KERR (Edinburgh) had taken a cross-section of public opinion in Leith by sending out 7000 pamphlets describing the Government's proposals and asking for a verdict on them; of the 6124 replies, 5000 were against State ownership of hospitals. Dr. SMALLPIECE, in her reply, said that the Government scheme followed closely that of the Oxford and Bucks Regional Hospital Board, and there was no reason why it should not work as well as that had done. But the meeting apparently knew some reasons, for it rejected her amendment by 210 votes to 29.

Mr. A. DICKSON WRIGHT (Marylebone) proposed a contrary amendment, viewing with "great disfavour the transference of hospitals to State ownership and the consequent destruction of local interest in hospital services, and the confiscation of trust funds intended by donors for specific purposes." The sequestration of hospital funds was a first step towards the confiscation of capital. The Minister had likened the position to that of the public schools which, at the beginning of the late war, had obtained permission to use trust funds to pay masters' salaries; but that had been an emergency measure, and there was no emergency now. The voluntary hospitals were not really hard up—they were thriving institutions well worth pinching. Dr. LEAK agreed. The Minister had justified confiscation of funds by reference to the Welsh Disestablishment Bill; but that Bill laid down that donations given since the 17th century should not be taken over. Mr. WRIGHT'S amendment was carried with one dissentient.

SALE OF PRACTICES

Dr. G. PRIESTMAN (Bradford) proposed:

That this Meeting regards as essential to the freedom of the patient and profession the right to buy and sell practices as at present.

Where, he asked, had the demand for abolishing the sale of practices come from? The young doctor coming out of the Services, if prohibited from buying a practice, could only apply to a Medical Practices Committee, and they would be very unlikely to give him a job where he wanted it. The established doctor was unlikely to find the compensation offered sufficient in all cases. Dr. J. A. L. VAUGHAN JONES (Leeds) thought it was not yet realised to what extent doctors borrowed money to buy practices. Under the Government compensation scheme £5 million was to be set aside for cases of hardship. The doctor who bought a practice on borrowed money must earn at least £1500 a year if he was to repay principal and interest, and many doctors earned less than that. No doctor could do his best work if saddled with debt. Dr. NESBITT WOOD (Hastings) looked on goodwill as a relic of the time when there was much more competition for private practice. If we turned down the Minister's proposals we might see a heavy decline in the value of our practices. There was no reason why doctors should not band together in group practices without any financial ties. Dr. COCKSHUT said that doctors had been one of the truly free sections of the community because they had owned the means of their livelihood. In the days of slavery the essential differences between slave and freeman were that the slave could not own property and could not choose where he worked. The buying and selling of practices was a much more fundamental matter than appeared. He congratulated the representatives on not being taken in by the £66 million.

Dr. W. S. MACDONALD (Leeds), who had tabled an amendment expressing no objection to the Government's proposals on sale of practices provided the terms of service and pay were satisfactory, suggested that the reason why the 1944 questionary showed a majority in favour of the abolition of sale of practices, whereas now there was a swing the other way, was that at the time of the questionary we still retained the war-time view that our belongings were not as valuable as ethical rightness. We were on muddy ground ethically in this matter of the purchase of practices. Dr. S. WAND (Birmingham) urged that this was not a question of money at all—it was a question of freedom. Now when we were all being asked to retrench the Government were proposing to spend £66 million so that they could direct a few doctors. The remarks of the Minister in Parliament the day before on the punishment of slackers had pointed unmistakably to a full-time salaried service. Mr. MARK S. FRASER (Cumberland) feared that if the Government took over their practices doctors would lose their bargaining power and would soon find themselves completely nationalised. Dr. DAIN denied Dr. Macdonald's "muddy ground" remark; they were not hoping to gain financially by retaining the right to sell their practices. Dr. O. C. CARTER hastened to nail a "lie" of the Minister's in Parliament the day before—that selling a practice is equivalent to selling patients; the patients we "bought" were free to leave us if we did not give them good value. But Dr. F. H. KEMP (Oxford) said his division did believe that the sale of practices was equivalent to selling patients, and welcomed the abolition of sale because it would lighten the young doctor's burden. Dr. LEAK and other speakers emphasised that the money a doctor gives for his practice is his bond to provide good service. The amendment from Bradford was then carried by 229 votes to 13.

DISTRIBUTION OF GENERAL PRACTITIONERS

Dr. N. STEVENS (West Suffolk) wanted there to be no control over doctors in the choice of where they would practise; otherwise son could not count on succeeding father, and the bereaved doctor might find himself tied to a distasteful place; with a reasonable capitation fee the distribution of doctors would, he suggested, adjust itself. Dr. G. DE SWIET (Paddington) urged the meeting to face realities: if the Government were offering a general-practitioner service in every

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area they could not accept dictation from doctors on where they should work. There was no mention of positive direction in the Bill—the only restriction was on the setting up of new practices in places where there were enough doctors already. We asked that we should be free like other workers; but most people must go where there is work for them and accept the work offered. It was unreasonable to expect to go where there were no vacancies. The meeting, however, declined to face realities of that kind, and the West Suffolk amendment was carried by 214 to 2.

The meeting expressed its agreement with Dr. ARTHUR (Gateshead) that doctors in the new service should be free to change their category; with Dr. O. WATTS-TOBIN (Chelsea) that when doctor marries doctor they should if possible be allowed to practise together; and with Dr. A. BROWN (Cambridge and Huntingdon) that a retiring doctor should have a say in the choice of his successor.

(Dr. R. P. LISTON: "On a point of order; has the Spens Committee reported yet?"—THE CHAIRMAN: "That isn't a point of order, and I don't know." But later Dr. DAIN announced that the Spens Committee *had* reported, a few days ago, and Dr. J. A. BROWN explained that whereas the Minister had seemed to deny this he had in fact said that he had not yet received a *full* report.)

REMUNERATION

Dr. H. H. GOODMAN (Newcastle-on-Tyne) moved that general practitioners in the new service should be paid by capitation fee only and that there should be no tapering scale of such fees. It was axiomatic, in his view, that doctors should be paid according to how much work they did and how much responsibility they took. A basic salary would cut across that principle and tend to slow down production. With a scale of fees tapering off as numbers increased the "cheapest" patients might get bandied about among doctors. Dr. KEMP, on the other hand, said that Oxford was keen on the basic salary, as being the right way to pay young doctors. There was a large pool of ex-Service doctors in Oxford who wanted to know "how much and how soon." Dr. A. BROWN looked on a basic salary as the thin edge of the wedge. He would give the doctor entering the service £500 a year until his capitation fees rose to that figure. Dr. T. C. S. WEBB (Woolwich) still wondered whether we would not be wiser to accept a salary, but Dr. DAIN said he clearly had not understood the fundamental objection to a salary. When a doctor entered a service under salary he owed allegiance to his employer; with a capitation fee he was an independent contractor. The ex-Service doctor had 1–1½ years to wait before he started work under the service, so whether he would come in under a salary did not affect his position now. Dr. A. TALBOT ROGERS (Bromley) referred to clause 33, section 2*b*, of the Bill which mentions a "prescribed limit" on the number of patients on a doctor's list. This upper limit must be fixed at a level where he could treat all his patients properly; there must be nothing to make the later patients less worth while.

The meeting then registered 209 votes in favour of capitation fee only and 8 against. They also expressed sympathy with pleas from Huddersfield and Westmorland for special consideration for industrial and extreme rural areas.

Dr. DAIN's motion approving of the council's report was then put to the meeting and carried.

General Attitude to the Bill

The meeting then turned to a series of motions which would remove any remaining doubts in the minds of Parliament, press, and public about the opinion of doctors on the Bill. The motions overlapped widely, so they were taken in groups; this saved a lot of time but made it difficult at times to know which motion was under discussion.

The first of these motions, from Goole and Selby (Yorks), would reject the enactments of the Bill entirely; this was a trifle too drastic even for the most extreme "antis."

Next came a moderately favourable one from the City division, approving the Bill's general framework. The City, said Dr. P. INWALD, had always advocated a comprehensive medical service as the next step to National Health Insurance, and one which would allow the general practitioner to order his life in a saner way. The Bill was rather hazy but would lay the foundations of a good service. We could not stop it passing, and if we rejected it the details would be worked out in our absence. The right function for the B.M.A. was not to opppose the legislature but to make its criticisms felt—to fight for decent remuneration and hours of work, and for the maximum of professional freedom. The Bill had met the doctors' wishes not to be directly controlled by local authorities. Local executive committees could best look after the interests of local practitioners. The compensation offered was generous. We had the right to enter the service or stay out. Let us approve the scheme in outline and then go on to criticise and amend it.

Dr. G. M. HOUSDEN (Hereford) objected to the powers given to the Minister to chop and change the Bill at will; these would make him a veritable dictator. Negative and positive direction were much the same; it made little difference whether a doctor was told that he could not go to anywhere but X or that he must go to X. What were the council going to do to see that the resolutions passed were carried into effect? Yesterday when the B.M.A. was mentioned in the Commons it raised a laugh. Let us tell the Minister: "We have discussed your Bill and are ready to work it on these conditions but no others." No general practitioner would dare to stay out of the scheme. The private doctor would be penalised in treating patients in hospital and would risk the loss of his capital, since if the service was a good one private practice would disappear. The representatives must be ready to fight to the last ditch for the resolutions passed.

Dr. G. O. BARBER (Mid-Essex), like Matthew Arnold, favoured sweet reasonableness. It was no use colliding head-on with the political views of our patients or our elected Government and saying we would have nothing to do with the scheme. Everybody approved of the general outline; it was the methods they did not like. Dr. COCKSHUT (Hendon), by now in terrific form, said the Bill would turn the profession into an inferior branch of technology. If this was an important step towards a comprehensive service, as the City had suggested, what was the goal? The Bill could have been written in two lines:

> "I hereby take powers to do what I like about the medical service of this country.—(Signed) Nye Bevan, *fuehrer*."

Mr. Shinwell, thanks to the powers given him, could send his bulldozers over Wentworth Woodhouse; we must make sure that Mr. Bevan never had powers to send his bulldozers over the medical profession (loud applause). Dr. INWALD, replying, pointed out that 35% of the profession already received whole-time salaries and this had not led to laziness. He himself had never found his clinical work or political views interfered with.

Dr. W. B. J. PEMBERTON (Camberwell) had been told by his patients: "Surely you doctors are strong enough to stop this Bill going through." If doctors stood up for their rights there was no need for repetition of the fiasco of 1911. The most popular institutions in the country were the family doctors and the hospitals. Dr. W. JOPE (Lanarkshire) looked on the profession as a sick person who had called in the family doctor (the B.M.A. council) with a new assistant (the negotiating committee) who had diagnosed a rare malady "aneurin" which neither of them had seen before. They had called

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in a consultant, the representative meeting, who had never seen it either. It was no good saying that they would prevent the illness altogether, but for God's sake let them try to make the patient better. Dr. PETER MACDONALD, chairman of the representative body last year, hoped that the Bill would be so modified in committee that it would be acceptable. Dr. J. A. IRELAND (council) drew attention to what the Government were doing in other fields. The Lord President of the Council had said that their aim was to pass bills in blank and fill in the details by regulations. He had never seen so much unanimity in a representative meeting. Mr. LAWRENCE ABEL, of Marylebone, quoted Mr. Bevan as saying there had not been negotiations and there would not be any; Parliament was supreme. But the public had soon shown who was the dictator on the question of dried eggs. Dr. R. HALE-WHITE, also of Marylebone, quoted Mr. Key's remark in the House that it was an impertinent claim for the individual doctor to decide whether he should be included in the scheme—thus freedom was called an impertinence. Though Dr. INWALD told Dr. COCKSHUT that the goal he feared was no worse than the emancipation of the people of this country from disease, the City's amendment was defeated, with but 5 supporters.

Dr. ARTHUR (Gateshead) then proposed:

That while agreeing on the need for improvement in and coördination of existing Medical Services this Meeting disapproves of the methods proposed in the Health Bill to achieve these ends.

The industrial area from which he came had, he said, largely enjoyed the service that the Bill promised for the last 15 years—i.e., they had been largely covered against financial loss from illness. The Government scheme could have been a good one if it had been based on the equipment and man-power available, but it would fall down if the man-power was not working at maximum morale.

Dr. BARBER thought the Bill unworkable; it was based on the strategy of an amateur. The scheme was unlikely to attract the necessary large entry of the right type of young people into the service. When the Minister was prepared to ask the doctors how to work the service they would be ready to help him. Dr. F. GRAY (council) called it a tragedy for medicine to be brought into party politics. In April, 1943, the Ministry of Health under the Coalition Government had put forward a measure for a full-time State salaried service. The permanent officials of the Ministry were the real enemy. The amendment from Gateshead was then put to the vote and carried with 2 dissentients.

Dr. LEAK protested against the number of important points left vague in the Bill to be filled later by regulations, and Dr. TALBOT ROGERS explained the two ways in which such regulations could become law. First, they could be placed before Parliament, and must then have the positive affirmation of both Houses. Secondly, they could be placed on the table of the House, when they would at once become law unless someone moved a successful prayer to upset them. If the regulations under this Bill were to come in the second category they must not be framed without discussion with the profession.

Dr. MURRAY-BROWNE (Gloucestershire) asked that the fitness of a doctor to continue in the service should be judged by the General Medical Council, and not by the tribunal set up under the Bill. Two-thirds of this tribunal would be chosen by the Minister. Dr. W. D. STEEL pointed out that the service, if acceptable, would become a complete one, and if a practitioner was turned out of it he would stand little chance of another job. The tribunal would therefore largely usurp the functions of the G.M.C. At Dr. Dain's suggestion, however, this point was left undecided, because the disciplinary machinery under the Bill was still under discussion.

By way of light relief, Dr. J. A. PRIDHAM (council) here interjected some figures to answer the criticism that the B.M.A. does not represent the profession. In 1935, he said, the association had 35,000 members; in 1939 it had 39,000; and in 1945 it had 51,508. Active doctors in the country were said to number 54,369, and the B.M.A. could claim to include some 75% of that total. The total membership of the Socialist Medical Association, medical and non-medical ("according to their organ, the *Times*"), was 1800.

COMPENSATION

The meeting agreed with East Herts that compensation for the loss of goodwill should be paid when a practice is taken over, and not on retirement or death. The discussion on this motion was chiefly remarkable for a solemn declaration by Dr. S. F. L. DAHNE (Reading): he had followed his father, his grandfather, and his great-grandfather in practice, and would never sell his birthright.

Dr. L. DOUGAL CALLENDER (Doncaster) proposed that doctors should be allowed to retire with compensation before the retiring age, for some would wish to take up other work. This was agreed, as was another motion from Doncaster that compensation should be paid for property used for professional purposes. Dr. R. G. ANDERSON (Gloucestershire) mentioned the case of specialist practices which are bought and sold; where it could be proved that a specialist had bought his goodwill he should receive compensation. Dr. TALBOT ROGERS pointed out that if the Minister was going to produce enough specialists he must recruit some G.P.s; the Minister's officials took the view that such practitioners were entitled to compensation directly they gave up general practice. Dr. DAIN here intervened to explain that the Minister did not intend to interfere with the buying and selling of specialist practices.

TERMS OF SERVICE

Mr. NICHOLSON-LAILEY (West Somerset) wanted the profession to pledge itself not to serve under the National Health Service unless a majority were satisfied with the terms and conditions of service and remuneration. There must be unity in the profession, and discipline should be enforced as in a trade union. Dr. H. SUTHERLAND, on the other hand, thought this suggestion premature. The B.M.A. had never been a trade union and he hoped it never would be. The power of a union depended on its ability to carry out an effective strike. Dr. A. C. E. BREACH (Bromley) said there was a majority view in his division that much of the Bill was sound and a suitable basis for negotiation. Block opposition was not the best way to deal with matters of this kind. The Bill would go down to history as well worked out. Dr. DAIN once more intervened to caution the meeting against precipitate action. This was not the moment for such pledges, because we did not yet know the terms of service. It must not be thought that the profession would break on a question of payment; that was why remuneration had been left in the hands of a lay committee. After this warning the motion from West Somerset was passed over. But the meeting agreed to one from Torquay saying that acceptance of any or all of the principles of the Bill must not imply that the profession would agree to work the service before they knew what terms were offered.

PLEBISCITES, REFERENDA, &C.

Dr. J. B. W. ROWE (Harrow) wanted a plebiscite of the whole profession taken before the council recommended doctors to accept or refuse to serve under the Act. Dr. A. C. DE B. HELME (Guildford) preferred a referendum to be taken at once. The meeting did not know the difference between a plebiscite and a

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referendum, and Dr. CHARLES HILL was called on to consult a dictionary. This he did with resounding effect, but the meeting's doubt remained. Dr. DAIN thereupon stated that a plebiscite would be taken by the council to find out whether doctors were prepared to serve, but this was not the appropriate moment for it.

DISCIPLINE

A motion from Buxton and Dorset urged that there must be a right of appeal from the decision of the Minister to the courts; this was generally agreed, and Dr. DAIN promised to bear it in mind. Dr. DE SWIET (Paddington) wanted legal representation for anyone appearing before a tribunal. The present arrangement, he said, was unsatisfactory; there was no legal representation, for example, before insurance committees. It was a pity that the new Bill said nothing about reform of the G.M.C., but it was a greater pity that it introduced a new disciplinary body, the tribunal, from which there was no appeal, and before which legal representation was forbidden. Dr. R. W. MCCONNEL (Bucks) thought a doctor would get more justice from a medical service subcommittee, on which there were no lawyers, than by dragging in law-courts. Dr. ARTHUR (Gateshead) asked that new machinery should be set up to decide on all matters of arbitration without reference to the Minister.

MIDWIFERY

East Yorkshire feared that general practitioners would be excluded from being called in by midwives in emergencies. While midwifery was still included in the medical curriculum, practitioners should be permitted to carry out domiciliary midwifery. Mr. J. D. R. MURRAY (Exeter) urged that the patient should be the one to choose the doctor rather than the midwife. Mr. NICHOLSON-LAILEY thought that every woman under the new service should be free to engage a private doctor for her confinement, who should obtain the fees under the service. There was no mechanism in the scheme for a family doctor to attend a normal case. Dr. PRIESTMAN (Bradford) emphasised that midwifery was essentially the job of a general practitioner provided he could call in a consultant if necessary. These suggestions were all carried.

PENAL POWERS

At this stage the meeting, with an eye to the 60 motions still outstanding, began to be a little hustled. This was a pity because Dr. R. COVE-SMITH now produced something of a bombshell in the form of counsel's opinion on section 35 of the Bill, which lays down the penalties for infringement of the regulations. He told the meeting enough of the legal opinion to make their hair stand on end in the few minutes allowed him. It appeared, for example, that a doctor might find himself involved in criminal proceedings if he sold a second-hand stethoscope to his successor. He made it clear that this section deserved careful investigation. Mr. A. DICKSON WRIGHT (Marylebone) described the penalties in section 35 as "savage," and Dr. HELME called the Minister's powers fantastic. He could withhold grants at any stage if he did not like the action of a doctor, and could even set up a new service by regulations. Dr. J. A. GORSKY (Westminster) agreed that the Minister could repeal any section of the Act or the Act itself on his own responsibility. Dr. COVE-SMITH, remarking that the price of freedom is eternal vigilance, advised the meeting not to be let in for the penal clauses.

PRIVATE PRACTICE

Dr. O. C. CARTER (Bournemouth) moved that under the Bill any private practitioner or specialist should have the same rights and privileges for treating patients as doctors have at present, and this was carried. Dr. S. WAND (Birmingham), speaking for the general-practice committee, said he could see no chance of the Government encouraging private practice. Dr. J. R. BAKER (Scunthorpe) would like to see a permanent private practice service, with equal facilities, set up as a yardstick for the public service. It would be to the detriment of the public service if no alternative was provided. Dr. R. P. LISTON (Tunbridge Wells) urged that G.P.s should have a right of access to any pay-beds available in hospital, and his motion was carried unanimously. Dr. J. B.W. ROWE (Harrow) wanted a grant-in-aid system to enable patients to obtain private attention if they wished, but Dr. WAND was afraid that if the Bill allowed grants-in-aid these might defeat the whole interests of private practice. Dr. ARTHUR, on the other hand, recalled that such grants had been worked by provident societies for years. In his view, they would save private practice in many areas. The meeting agreed to support a grant-in-aid plan.

DEMOBILISED DOCTORS

Dr. A. A. MCINTOSH NICOL (Sunderland) asked for urgent attention to be given to the interest of ex-Service doctors, and suggested that such attention would help to enlist their coöperation in the opposition to the Bill. He urged that part of the B.M.A. fighting fund should be allocated to Service doctors who could not find a suitable job because of uncertainty as to the future. They would be driven into a State service by lack of money. Dr. W. B. A. LEWIS (Shropshire) said the ex-Service doctor was a very real weakness in the position of the profession. The B.M.A. scheme for helping him to buy a practice offered terms little better than that of insurance companies. Mr. C. E. BEARE (Reigate) hoped that doctors selling practices or taking in assistants would offer the new man better terms than before—e.g., one year's purchase without interest. The meeting agreed unanimously to recommend a share of the fighting fund for ex-Service doctors.

VACCINATION

Perhaps because it was hurried, the meeting was hasty in supporting a motion regretting the abolition of compulsory vaccination in the Bill. Dr. COCKSHUT explained to them that abolition was proposed on the advice of experts, who were unanimously of the opinion that, far from reducing the amount of vaccination done, abolition of compulsion would considerably increase it. This was one occasion on which the Minister had acted on expert advice, and it would be a pity if the meeting opposed the experts. The meeting thereupon reversed its opinion.

Medicine and the Law

Overdose of Moryl

FOR the third year in succession we have to record a death due to an overdose of carbachol. At a recent inquest at Croydon upon the death of Margaret Bullock, a married woman, the doctors were alleged to have been misled by the printed instructions issued by the manufacturers.

The evidence, as recorded in last week's issue of the *Croydon Advertiser*, was as follows. The deceased was admitted to the Croydon General Hospital at about 10.30 A.M. on April 19; she had been warned on the previous day by a member of the medical staff when she visited the hospital for examination that she ought to enter the hospital at once; he had found that her pulse-rate was over 160. When she entered the ward on the 19th, he found that the pulse-rate had not fallen. He discussed the case with the house-physician, asked at the dispensary for 'Mecholyl,' was told that there was none in stock, and being shown a box of 'Moryl,' ordered the injection of one ampoule of moryl. The drug was sent to the ward from the dispensary. The house-physician read the instructions in the box; the dosage printed agreed with the dose which had been ordered, and the ward sister was directed to carry on with the injection. The house-physician had not

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used moryl before and was unaware of its history or of the dosage but followed what were understood to be the printed instructions issued.

At 1.15, in response to an urgent call, the house-physician visited the ward and found the patient very blue and gasping for breath; her pulse was not palpable at the wrist. The patient collapsed and died very quickly. Informed of the fatality, the doctor who had ordered the moryl to be administered inquired what amount had been injected and was told that the dose was 0·1 gramme. He immediately realised that there had been an overdose, since the correct dose should have been 0·00025 g. After seeing the house-physician and ward sister, he telephoned to Messrs. Savory and Moore, the manufacturers, and asked them how it was that one gramme of moryl was in a box containing printed instructions that the dose of moryl should be a half to one gramme repeated three or four times during the day. It was Good Friday and he could not get in touch with the managing director till next day. The latter telephoned to him on the Saturday and, in the course of discussion, referred to the previous case at Oxford about 18 months earlier; after the Oxford incident, he said, he had twice caused notices to be published in THE LANCET asking for the ampoules to be returned.

Mr. Samuel Stevenson, chief chemist to the manufacturers, mentioned the Oxford case in his evidence before the coroner. After the inquest at Oxford, he said, Savory and Moore had been asked to withdraw all the packets then in use; a telephone message had been sent on behalf of the manufacturers to the Croydon Hospital, asking for the return of any packets they possessed. The firm's records showed that the hospital received moryl in December, 1940, to be used for ionisation. The hospital disputed the statement that it had received a telephone message from the manufacturers.

The pathologist who conducted the postmortem examination said that Mrs. Bullock had been in a serious condition. She had a cancer in the left breast and a lump on the thyroid gland. Death was caused by poisoning due to an overdose of moryl. The deputy coroner, in summing up, said that the hospital doctors had admitted an error. The jury might find that the hospital had, or had not, received word to send back the drug; it was possible that the firm's instructions had been misleading. The jury returned an open verdict.

Besides the Oxford fatality already mentioned (*Lancet*, 1944, ii, 609, 669) there was a similar death in the Coventry and Warwickshire Hospital (1945, i, 504). In the Oxford case the widow of the deceased was awarded damages against Savory and Moore Ltd. in an action alleging that the firm had been negligent. The negligence which the judge found to be established by the evidence consisted of the packing of moryl crystals in an ampoule and putting into a box containing ampoules of crystal moryl a pamphlet of printed instructions similar to the instructions put into boxes containing ampoules of the liquid form of the drug. In the light of the three cases which have now occurred, it is obvious that dispensaries should overhaul their stores and see that no further risk is run.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED APRIL 27

Notifications.—Infectious disease: smallpox, 0; scarlet fever, 1054; whooping-cough, 1669; diphtheria, 389; paratyphoid, 5; typhoid, 4; measles (excluding rubella), 2793; pneumonia (primary or influenzal), 654; cerebrospinal fever, 48; poliomyelitis, 5; polio-encephalitis, 0; encephalitis lethargica, 0; dysentery, 163; puerperal pyrexia, 148; ophthalmia neonatorum, 50. No case of cholera or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on April 24 was 1161. During the previous week the following cases were admitted: scarlet fever, 45; diphtheria, 30; measles, 87; whooping-cough, 26.

Deaths.—In 126 great towns there were no deaths from enteric fever, 3 (0) from scarlet fever, 6 (1) from measles, 7 (3) from whooping-cough, 1 (0) from diphtheria, 56 (6) from diarrhœa and enteritis under two years, and 18 (2) from influenza.

The number of stillbirths notified during the week was 235 (corresponding to a rate of 27 per thousand total births), including 32 in London.

In England Now

A Running Commentary by Peripatetic Correspondents

THIS year the summer exhibition of the Royal Academy begins in the courtyard of Burlington House where King George V sits ready mounted for his journey to Adelaide, while a rather dwarfed Sir Joshua seems to be dashing off a farewell sketch of the departing monarch. Inside, the academicians have decided to put the war behind them as quickly as possible, and there are very few uniformed portraits—a dubious gain, modern masculine dress being what it is. But Mr. Rodrigo Moynihan has contributed an effective study of Mr. Somerville Hastings wearing his badge of office as chairman of the L.C.C. for 1944–45. Mr. Henry Lamb, a contemporary truant from medicine, shows portraits of children and adults, including a notable head of Benjamin Britten. Among the sculpture is Mr. Escourt Clack's bronze bust of Sir Alexander Fleming, F.R.S., and Mr. Benno Schotz's bronze of Sir Donald Pollock, lord rector of Edinburgh University from 1939 to 1945, in academic hood. Mr. Huxley Jones's head of Dr. Douglas MacCalman is in the central hall. The architectural drawings include Mr. Herbert Clark's plans for a special hospital on a town site; W. and T. R. Milburn's sanatorium at Middlesbrough; Stanley Hall and Easton and Robertson's rebuilding scheme for the London Chest Hospital; and Henry Braddock's old people's dwellings at Ashford, Kent.

* * *

There were only two F.B.S in eye, a dogbite, and a no-doctor's-letter waiting in the receiving-room until he arrived to disturb us. His inanimate bloody body was escorted in by a policeman, two ambulance men, an Underground inspector, and a witness. The history was confused, but the odds seemed on the razor-slash story of the witness rather than the fit story of the inspector. When all the blood had been cleared up, the only wounds to be found were two parallel scratches on each cheek and across his forehead. Sister looked over the screen, said "Fake," and started to talk to a detective who had arrived by then. Encouraged by Sister's diagnosis and a completely normal C.N.S. we tried the routine inch of hatpin without much success; face-slapping and corneal trauma were also non-productive, and more medieval methods of revival were being planned when Sister looked over again and hissed "Talk about jail." The sentence "Well, if he doesn't behave himself he'll have to go to jail" produced complete recovery, the patient sitting up and saying, "Sure and that's where I want to go." Rather shattered by this, we appealed to the detective, who thereupon recognised the patient as an old and valued customer. A short conference, in which the patient took an active part, decided it would be best to be arrested as drunk and disorderly, a plea of destitute not being allowed in view of his considerable financial means and a Salvation Army hostel season ticket.

As he was leaving he told us he wanted to go to jail because he had found that the regular meals and sleep provided by His Majesty did his "gastric" the world of good.

* * *

It was impossible for one whose last visit to the Continent was in the spring of 1939 to conceal his excitement as the Belgian coast and Flanders came into view through the windows of the Sabena Company's twenty-seater plane. I turned to my neighbour, a young Belgian civil servant returning from an economic conference in London, and said: "This is D-day for me." "It will be rather different on this occasion," was his reply; "there will be no resistance."

The Brussels airport looked dreary and empty in the darkening afternoon of a hard winter day. I was surprised to find the R.A.F. still in titular control and that all travellers went through the bottle-neck of British military security. At the Sabena office the wife of my Brussels friend and colleague—my hostess on many previous visits—was waiting with a car to convey me to the club of the Fondation Universitaire (F.U.) where I had been a temporary member on similar missions before the war. Behind its simple façade in the quiet Rue d'Egmont the interior of the F.U. looked as dignified and elegant as ever. *Le tarif*, allowing for the increased cost of living, was still moderate—English

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club prices for my room (the bathroom stocked with towels of pre-war quality) and for my "breakfast" (café complet). The table d'hôte luncheon was a little expensive on British standards, but remembering the excellence of the pre-war cuisine this did not seem unreasonable. I was not disappointed.

The shadow international committee of eight people assembled next day, representing France, Great Britain, Scandinavia, Holland, and Belgium, and including the president of our International Association, one of the most distinguished of pre-war Paris surgeons, now retired from his chair and hospital. Our business was to discuss plans for reviving the activities of the association, to decide when and where the next international congress should be held, and, most important of all, to expel members from enemy countries. After a three hours' sitting we had settled the rest of our business but failed to decide on the exact procedure of expulsion. The speed of the arguments at times left me giddy and guessing. At one stage, the torrential flow of French was interrupted by the Danish delegate breaking into German, to be followed immediately by the Dutch and Belgians in the same language. As I had learnt German at the age of nine, this was a welcome relief—but it was an ironical moment.

The discussion was resumed later in the hospitable home of our senior Belgian colleague, and before the large dinner party assembled in our honour had broken up. The Spanish delegate had arrived from Barcelona too late for our committee meeting but in time for the superb dinner. The proposition regarding expulsion was explained to him by our president in a sentence of incomparable brevity, possible only in the French language: "Nous cherchons une formule juridique valable." Shortly before midnight we had found the formula under "Article Onze" of the constitution, and we returned to the company and the cognac.

Next morning, a Sunday, I woke to find Brussels covered by a mantle of snow which rapidly froze on the pavements. The central heating of the F.U. was comforting, and I was loth to turn out in the evening to seek my dinner in a near-by restaurant. It was then that I came into contact with the prices of the universal black-market in food. For the first time in my life I argued with a waiter about the cost of a meal; we finally agreed on 150 francs (17*s.* 6*d.*) for the smallest lobster of a bunch arranged on a side table. The café filtre here, as in all the restaurants and cafés, was nectar. Next day the weather was savage and the sky dark. After settling my modest account at the F.U. I arrived at the Sabena office to be told that no plane could land at Croydon that day, though if the weather improved a special plane expected back from the Belgian Congo would leave early next morning. It was thus necessary to get accommodation for another night in Brussels in a hotel, where I met the full blast of the prices for tourists. I left the hotel at 6.30 next morning in pitch darkness in a "taxi noir" and was driven a quarter of a mile to the now familiar Sabena office. "Soixante quinze francs monsieur—c'est le tarif du gouvernement." I protested that we had liberated his country at great cost, but paid up. The twenty-seater Congo plane left the ice-bound airport after a hazardous start. Our first attempt at a take-off was a failure—a mild bump—back to earth just as we were airborne. We crossed the Channel at 3000 feet, in a beautiful sea of white clouds, to touch down at Croydon just three minutes before a dense fog enveloped the whole aerodrome.

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In England now, incredibly, and April here. As I walked through the fields again that afternoon the cuckoo opened his bill, and I thought of April last year when the ubiquitous bird sent fancy home from the far corner of the earth.

In Shirekawa we awoke to glorious spring days knowing that we had somehow survived another winter. There was dew on the grass in the early mornings and this softened the bare feet, and banished dropsy too according to the little Japanese sentry. Garish flowers bloomed in the beds, and over the stockade the central mountain range rose blue and ethereal in the sky. A golden oriole piped in liquid phrase, and a jangle announced a company of infantry double-marching by, keyed up to repel the invasion which never arrived. The end came later to cloud-cuckoo land, not with a bang but a whimper.

Letters to the Editor

FOWLER'S POSITION

SIR,—Mr. Spalding's article in your last issue marks a step forward in surgical teaching as important as that made in the realm of technique by Terence Millin's on the retropubic operation for prostatectomy. I personally am delighted to find such sound reasoning and such convincing evidence in support of views to which I have been inclining for the last ten years.

As a surgical beginner I was struck by the extreme discomfort of the Fowler position, by the tense face, braced neck, clenched hands, and dug-in heels of the patient, and the pink cheeks of the nurses who struggled hourly to lift him from the prolapsed to the approved position. In 1925, in the course of some experiments on absorption from the peritoneum, I found that carmine particles introduced into the abdominal cavity of animals were taken up entirely by the great omentum and the diaphragmatic peritoneum.[1] At that time, however, the evidence of the ward and the laboratory was not enough to offset in my mind the dictates of authority.

Just before the war I received from Burns Plewes, a young Canadian surgeon, who had worked with me in London, his M.D. thesis on pulmonary embolism.[2] In the group of surgical wards whose records he investigated, there had been two or three cases of pulmonary embolism yearly up to 1930, 4 cases in 1931, 12 in 1932, 28 in 1933, 16 in 1934, 35 in 1935, 30 in 1936. This remarkable increase was found to correspond in time with the gradual re-equipment of the wards with a cranking frame bed giving a fixed Fowler position, so that more patients were put in this position, they remained there without a struggle, and they tended to be kept there longer.

During the campaigns in Africa I was greatly impressed by the regularity with which patients with abdominal injury who could not, on account of other wounds, be propped up, recovered without any pulmonary or embolic complications, and without residual abscesses. I found that forward surgeons and anæsthetists had noticed the same thing, and that they were inclined first to doubt the value of the Fowler position, later to discard it. I thus became convinced that abdominal patients, at any rate those whose injuries were below the diaphragm, did better if they were nursed flat, and rolled at intervals from one side to the other, than if they were propped up in the Fowler position.

I have returned to civil practice a convinced anti-Fowlerite, and I have been confirmed in the soundness of this position by seeing Spalding's long record of acute abdominal emergencies of every kind without supra- or sub-diaphragmatic complications. I hope that his article will stand as a landmark in the progress of the surgeon from the mechanically trained technician to the function-minded physician-craftsman.

London, W.1. HENEAGE OGILVIE.

SIR,—In his admirable article Mr. Spalding draws attention to recent work which has established the fact that postoperative thrombosis, which may give rise to pulmonary embolism, begins in the veins of the calf and not in the iliac or femoral vessels as has so often been taught.

If pulmonary embolism, perhaps the most tragic of all postoperative complications, is to be avoided every care should be taken to minimise the incidence of thrombosis in these veins of the calf. For this reason the "knee pillow," popular with some nursing staffs, is to be condemned, inasmuch as it may lead to thrombosis by producing venous obstruction.

It is possible also to take another precautionary measure—namely, to avoid prolonged pressure on the calf of an immobile patient lying anæsthetised on the operating-table. For the past nine years in this unit it has been a routine procedure to elevate the calf muscles so that they lie clear of the surface of the operating-table. As soon as the patient is lifted on to the table a piece of 'Sorbo' rubber with a square section of

1. Ogilvie, W. H. *Brit. J. Surg.* 1925. **12**, 752.
2. Plewes, B. *Canad. med. Ass. J.* 1939, **41**, 271.

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five inches and two feet in length is placed under the Achilles tendons so as to lift the calves clear, and this is left in position throughout the operation. In Service and other hospitals I have been accustomed to use a sandbag for the same purpose.

The incidence of pulmonary embolism is fortunately so low that it is difficult to provide statistical evidence, worthy of consideration, in favour of this simple measure. Nevertheless I would commend its extended use. As far as I am aware no case of pulmonary embolism has occurred in any of our patients for whom it has been used. From time to time I have drawn attention to it (*Medical Annual*, 1939, p. 394; 1942, p. 49) but it does not appear to be as widely practised as I believe it might be with advantage.

Surgical Unit, Royal Infirmary, Cardiff. LAMBERT ROGERS.

EMPLOYMENT OF HOSPITAL STAFF

SIR,—Sir Ernest Rock Carling has done well to remind us of the current misuse of the terminology "employer" and "employee" as applied to the status of hospital staffs (April 27, p. 626). It is appropriate that the argument should be carried into the wider realm of general ideas; and what I have to say here, for lack of space, must be expressed dogmatically. It cannot be stated too often, or with too much emphasis, that the terms "employer" and "employee" have no historic, social, or legal significance in relation to the manifold activities of a free, learned, and self-governing profession, whose traditions go back to the time of Hippocrates and to the great age of Greek thought. The employer-employee relationship belongs essentially to the language and techniques of the practice of commerce, although in our modern industrial society, in an era moving towards collectivism, the traditional connotation of these terms is becoming less clearly defined—but this is another story.

The doctor-patient relationship of general practice is not the relation of employer and employee. Nor is the health officer (any more than the town clerk) an employee of the city or county council. Both are appointed officers of a local authority and are servants of the community in the classical sense of that term. The position of specialist staffs of hospitals (both voluntary and local-authority), vis-à-vis committees of management, whether these specialist staffs are serving in an unpaid capacity or are in receipt of token honoraria, sessional fees, or salaries, is again not that of employee and employer. Nor, in my judgment, would that relationship obtain in a regional administration, set up under any system of common ownership of hospitals.

It must be insisted that managerial functions and responsibilities are one thing; professional functions and responsibilities are another. The functional pattern of any hospital, in terms of the practice of the healing art and the advancement of medical science, is the sole creation either of the members of the staff of this generation or their predecessors. This is an undisputed prerogative of the free profession of medicine, who are concerned with hospitals as vehicles through which their contributions may reach their fellow members of society.

The relation of specialist staffs to the various types of governing or managerial committees of hospitals is in every way comparable to the relation of the teaching staff of a university to its lay governing body. In such a relationship the implication of employer and employee not only has no meaning, but if invoked would be insulting. In a long period of service on the staff of a voluntary hospital, as consultant to an important local authority and in surgical charge of one of its hospitals, and as a university teacher, I cannot recall any corporate or individual pronouncement that I or my colleagues were employees of any institution through which it has been our privilege to serve the community of the region in which we work.

The personal opinion of the chairman of the British Hospitals Association, which prompted Sir Ernest Rock Carling's letter, should leave the consultant and specialists of this country completely unmoved.

Manchester, 13. HARRY PLATT.

NEURONAL DAMAGE FROM CARDIAC ARREST

SIR,—The article by Wing-Commander Howkins and others in your issue of April 6 is of great academic interest, and leads me to recall a similar case of my own, with cell damage in the mid-brain after cardiac massage, in which the patient only "lived" a further 16 hours.[1]

What is more important, however, is to consider how such a tragedy can be prevented. There are three main facts: (1) the patient was a healthy married woman, aged 32; (2) the operation was short and simple; and (3) the patient died. It would be useful to know what drugs were given before operation; for these may have influenced not only the anæsthesia but also the onset of anoxia. To my mind, the report of the cardiac failure in this case clearly indicates that the patient died of anoxia.

This brief and simple operation could have been done (1) under 'Nupercaine' anæsthesia, or (2) under 'Pentothal' and gas and oxygen; but why all three? The senior anæsthetists in this country have for some time been alive to the risk of anoxia under spinal anæsthetics, and this case will reinforce their warnings.

For years I have used nupercaine by Howard Jones's method for perineal and abdomino-perineal excisions of rectum. A large man may be given morphine gr. 1/6 and hyoscine hydrobromide gr. 1/200. Spinal analgesia is then induced to the level of the 6th dorsal vertebra, and the patient placed in a position for operation; and I have known as little as 0·15 g. pentothal keep one asleep for over half an hour. Being mostly paralysed, they receive no stimulus to awaken them, and many a patient has thanked me for a comfortable sleep when leaving the table. If this dosage is right, it would seem that 0·5 g. of pentothal in addition to the spinal anæsthetic is too heavy a dose.

It is my practice to administer oxygen to all patients under spinal anæsthesia, whether conscious or unconscious, whether they appear to need it or not. Most teachers favour this as a precaution against accidents.

Great Brington, Northampton. F. F. WADDY.

*** Mr. Howkins, to whom we have shown this letter, writes: "I must point out that in our article all criticism of the anæsthesia was studiously avoided. The case was presented because of its clinical and pathological interest. Speaking only for myself and not for my co-authors, I agree with Dr. Waddy when he suggests that an efficient spinal in itself should be sufficient anæsthesia provided that the patient is a suitable subject. If absolute silence and quiet movement are maintained in a theatre there is no reason why the patient should have any additional anæsthetic. I do not, however, think that in this case the anæsthesia was responsible for the patient's death, and one point in favour of this is the time of onset of the cardiac failure. Occasional cases of pentothal sensitivity are seen and I can recall a middle-aged airman who died after a small dose of pentothal for an ear, nose, and throat operation—0·5 gramme as far as I can remember. In this case the patient never recovered consciousness, though he was kept alive for some hours by artificial respiration. In answer to Dr. Waddy, the premedication used in the case reported was 'Omnopon' gr. 1/3, scopolamine gr. 1/150."—ED. L.

THE TUBERCULIN-TESTED CHILD

SIR,—As Dr. Comfort points out (April 20) the parents of a child found to be Mantoux-positive have a right to know what that implies, especially in view of the recent alarming pronouncements of Moncrieff and Gaisford. Most cases of tuberculous meningitis die in hospital; so pædiatric physicians tend to see the grimmer side of the picture. There are undoubtedly wide geographical variations, and no comprehensive figures are available in this country; but the experience derived from the population served by the Ealing Chest Clinic seems to confirm that of workers in the United States.

In the years 1942–45 we examined 1476 children for the first time, 462 of whom were under the age of five. Of the 395 of these who had been definitely in contact with tuberculosis, 249 were positive to an intradermal injection of up to 1 in 100 old tuberculin. Of the 67

1. Waddy, F. F. *Brit. J. Anæsth.* 1942, **18**, 60.

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not known to have been in contact, 21 were positive. Death occurred within three months in 4 of the former group and in 2 others originally tuberculin-negative who later became positive. Of the remainder, all those with demonstrable tuberculous lesions made a good recovery, with or without institutional treatment, and those without such lesions continued well and free from serious tuberculosis.

In the light of this experience, I feel justified in giving all young positive reactors a guarded prognosis for the immediate three months and a confident one if this critical period is safely survived.

BRIAN THOMPSON
Tuberculosis Officer,
Middlesex County Council.

Ealing Chest Clinic,
London, W.13.

PARALYSIS AGITANS

SIR,—On April 27 you published a letter explaining that the National Hospital, Queen Square, has severed its connexion with the Parkinson's Research Society of which I am chairman and was the original Founder. I hope you will allow me to state my and the society's case.

The society was formed by near relations of victims and by victims of this terrible disease, stated to be incurable, in order to produce funds for research in the hope of finding a method of cure. In fact we raised funds or promises of funds amounting to nearly £7000.

We naturally turned to the National Hospital for help, and Mr. E. Mitchell, their secretary, became our hon. secretary and Dr. E. A. Carmichael joined our committee. Among many doctors with whom various members had been in consultation was Dr. W. M. Crofton. In reply to a communication from me he wrote: "There is no necessity to do any research in Parkinson's disease. The microbial cause of this is completely worked out and a specific method of treatment can always be used. If this is used when the first symptoms appear, the case is rapidly cured." I was further informed by Dr. Crofton that this form of parkinsonism was long ago discovered to be one of the sequelæ of influenzal encephalitis, for which a method of specific treatment had as far back as 1919 been demonstrated (notably at the Northern Hospital, Winchmore Hill) by means of a specific antigen of the bacillus which can be isolated in each case. If the disease was treated in the early stages, before irreparable damage had been done, the cure was absolute; even in seriously damaged cases arrest and improvement in symptoms had been amply demonstrated.

To sufferers, who had been informed that the cause and cure were unknown, this was a great hope, and I asked Dr. Crofton to meet the committee and demonstrate cases. This he did to the satisfaction of the committee and to the great interest of two doctors present, one of whom was Dr. Hill's successor at the Northern Hospital. Mr. Mitchell and Dr. Carmichael excused themselves from attendance, chiefly on the grounds that meetings should not be held elsewhere than at the National Hospital. Books and papers were supplied by me to Dr. Carmichael, but the latter made no comment on them.

The National Hospital now repudiate further connexion with this society, and say that their medical committee cannot endorse these claims which they have not even tested. But respectfully I would point out that the cured sufferers and those who have benefited by the treatment *can* endorse the claims, at least in so far as the treatment is concerned. We are not a commercial association for the purpose of selling drugs or enriching ourselves or anybody else—we are "incurable" sufferers seeking a cure by whatever means possible; and this we appear to have found. I cannot see that it is in the public interest for a hospital medical committee to issue a disclaimer which is tantamount to a negative of these claims without any test whatever.

E. TELLER
Chairman, Parkinson's Research Society.

Bidborough, Kent.

*** We understand that the National Hospital takes the view that these claims are not supported by any adequate published evidence, and in consequence the hospital cannot endorse them. To take this attitude, however, is not to object to a due examination of any substantial scientific evidence which may be forthcoming.—ED. L.

RESTORATION TO WORK

SIR,—In last week's annotation you quote certain figures as my estimate of the number of people in Great Britain likely to need medical reablement, vocational advice, training for fresh occupation, or sheltered employment, as a result of disability. May I point out that in the article from which these figures are taken I merely said that if the American estimates were applicable to Great Britain, the figures would be as quoted, but that it looked at first glance as though they represented a somewhat liberal estimate. The fact is that we have altogether insufficient data upon which to base any accurate estimate at present, but ample evidence that the problem will be one of considerable dimensions.

May I also point out that instead of stating that disabled persons now appearing at employment exchanges for purposes of registration needed "medical and industrial advice first," as quoted in your note, what I actually said was that "it is medical advice and not industrial which these disabled persons first need, for in many cases their disabilities could be greatly reduced by a suitable course of medical treatment and rehabilitation, or by expert opinion as to the type of work they could best do or the conditions they should avoid."

HAROLD BALME.

Beckenham, Kent.

NEW REMEDY FOR LUPUS

SIR,—Dr. Dowling in his letter of April 20 draws attention to the dangers of large doses of vitamin D_2 in the treatment of lupus and suggests that as a safeguard the level of calcium in the blood should be regularly estimated. But vitamin-D poisoning may occur without hypercalcæmia; so probably the archaic habit of noting the patient's symptoms—though more irksome than sending his blood to the biochemists—gives the best warning that further treatment should be given with caution. The frequent testing of the urine for albumin is also a simple precaution and one which I believe some doctors still do without laboratory assistance: some might even look for the calcium casts which may often be found with hypercalcæmia if the urine is not highly acid.

The *early* symptoms of poisoning vary, those most frequently reported being acute tenderness of the scalp at the back of the head; a feeling of general well-being and an increased appetite, both soon changing to general fatigue with headaches and nausea; polyuria; pains in the teeth, jaws, and joints; paræsthesiæ; and a socially inconvenient increase in libido. Small doses of yeast may abolish minor symptoms and so allow treatment to be continued. Personal idiosyncrasy may prevent taking even such small doses as 25,000 I.U. daily, and patients who are fat or bedridden may also have a low tolerance.

From the practical point of view, however, the risk of any serious or lasting injury from vitamin-D poisoning is so slight as to be no contra-indication to therapy unless the patient becomes definitely ill, or develops albuminuria, or has renal or vascular degeneration before treatment starts. In all such cases the local application of a vitamin-D_2 ointment appears to be an alternative to oral treatment which is worthy of trial, since the concentration of the vitamin would be raised in the lesion but not to the same extent in the rest of the body—a logical aim if, as seems most probable, vitamin D_2 has a direct action on the tubercle bacillus.

FRANKLIN BICKNELL.

London, W.1.

CONTRIBUTORS to the *Journal of Endocrinology* have recently formed a new society with the aim of advancing endocrinology by observational, experimental, and clinical studies. The inaugural meeting was held at Guy's Hospital, London, on April 26, when the following elections were made: hon. secretary, Mr. S. J. Folley, D.SC.; hon. treasurer, Mr. C. W. Emmens, PH.D.; hon. editor of the society's proceedings, Prof. S. Zuckerman, M.R.C.S., F.R.S.; members of committee, Dr. P. M. F. Bishop, Mr. A. S. Parkes, D.SC., F.R.S., Mr. P. C. Williams, D.SC., and Prof. F. G. Young, D.SC. The address of the hon. secretary is: c/o the National Institute for Research in Dairying, Shinfield, nr. Reading.

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Obituary

WALTER EDWARD DANDY

M.D., F.A.C.S.

THE death is announced of Walter Dandy, professor of neurological surgery at Johns Hopkins University, Baltimore. Born in 1886 of parents who came from Lancashire, he qualified in 1910 and became assistant to Harvey Cushing in the Old Hunterian Laboratory at Johns Hopkins. At that time he worked on the blood and nerve supply of the hypophysis, but it was not until 1913–19 that he showed his powers as a surgical experimentalist by his observations, partly with Kenneth Blackfan, on internal hydrocephalus, in which he proved in dogs that the cerebrospinal fluid was formed at the choroid plexus, and boldly attacked infantile hydrocephalus by excision of the choroid plexuses of the lateral ventricles. At this time also he was assessing with George Heuer the value of radiography in the diagnosis of brain tumours, of which they were able to collect 100 cases.

The discovery of ventriculography was made in 1917, and in the *Annals of Surgery* for September, 1919, Dandy has related the incident which was the starting-point of his most important work. In January, 1917, as a member of Halsted's staff he was asked to see a case of suspected intestinal perforation in the medical wards at Johns Hopkins Hospital. The diagnosis had fluctuated between typhoid fever and acute miliary tuberculosis with intestinal involvement. An operation was (characteristically enough) "agreed upon"; but there were some who were not satisfied; so on the way to the operating-theatre they examined an X-ray film of the chest which had been taken a few hours before, and this showed the dome of the diaphragm clearly outlined from the liver by a zone of free gas, whose presence was subsequently confirmed by operation. Dandy saw at once the diagnostic advantages to be expected from injecting air into body cavities and photographing the X-ray appearances. In July, 1918, he published his first paper on ventriculography, and this was followed quickly by papers on encephalography, on the diagnosis of hydrocephalus from stricture of the aqueduct of Sylvius, and on the use of ventricular estimation in localisation of intracranial tumours in patients who were too ill for ventriculography. As is well known, ventriculography added greatly to the precision of localisation of expanding intracranial lesions; indeed it played a major part in opening up the field of intracranial surgery. Dandy applied it to the diagnosis of pineal and third-ventricle tumours and was the first surgeon to remove successfully a pineal tumour and a benign colloid cyst of the third ventricle. In each case he designed an operative approach.

He was a dexterous and bold surgeon. He advocated total removal of acoustic tumours (1922), as opposed to the more conservative intracapsular enucleation of Cushing which could usually be carried out without producing facial palsy. He introduced the operation of removal of the anterior part of the frontal lobe to obtain access to basal meningiomas, and the operation of complete removal of the right cerebral hemisphere for malignant glioma producing hemiplegia. He worked out an approach to the cranial nerves in the cerebellopontine angle through which he divided the 5th nerve for trigeminal neuralgia, the 8th nerve for aural vertigo, and the 9th nerve for glossopharyngeal neuralgia. He described prolapse of the intervertebral disk, with operations in two cases, in 1929, and suggested that it offered a pathological basis for sciatica; but he evidently did not follow this up at the time and though he became a whole-hearted devotee of the operation later in his life it remained for Ayer and Mixter to establish the frequent relationship of prolapsed disk and sciatica.

Besides devising other operations Dandy made important contributions to the study of angiomatous malformations and other lesions of the brain. Indeed, there are few fields in the surgery of the central nervous system on which this brilliant experimenter did not leave his mark, and his volume on intracranial surgery in Dean Lewis's *Practice of Surgery* is a monument to his originality and his power of grasping the essentials of a problem.

In the clinical side of his work Dandy appeared to be less interested, and his writings on clinical subjects were sometimes too dogmatic to carry conviction. He was the very antithesis of Harvey Cushing, and this at times obtruded itself in their relations with one another, though not in their later years. Neurosurgeons are wont to compare the two and their contributions to neurosurgery—the one a comparatively lonely worker influencing the subject mainly by his ideas developed by operative experiments; the other always a cautious doctor, using the experimental method with less power but greater thoroughness, and irradiating his personality over pupils in many lands. The usual conclusion is that both types are essential to the progress of medicine.

Medical Diary

MAY 12–18

Monday, 13th

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8 P.M. Mr. J. Johnston Abraham: The Two Fothergills. (Annual oration.)

Tuesday, 14th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. *Experimental Medicine and Therapeutics.* Dr. Sheila T. Callender, Dr. J. F. Loutit: Life and Death of the Red Blood Corpuscle.
5.30 P.M. *Psychiatry.* Dr. C. P. Blacker, Dr. Thomas Beaton: Organisation of a Psychiatric Outpatient Service.

Wednesday, 15th

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
4.30 P.M. (Bangour Hospital.) Prof. Charles Cameron: Demonstration of cases.

Thursday, 16th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. B. W. Rycroft: War Wounds of the Eye and their Treatment. (Hunterian lecture.)
ROYAL SOCIETY OF MEDICINE
5 P.M. *Dermatology.* Dr. R. G. Cochrane: Significance of Cellular Changes in the Corium in the Pathology and Diagnosis of Leprosy. (Cases will be shown at 4 P.M.)
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Portland Place, W.1
8 P.M. Colonel Thomas T. Mackie: Observations on Tsutsugamushi Disease (Scrub Typhus) in Assam and Burma.

Friday, 17th

ROYAL SOCIETY OF MEDICINE
8 P.M. *Obstetrics and Gynæcology.* Clinico-pathological meeting.
8 P.M. *Radiology.* Dr. S. Cochrane Shanks: Place of the Radiologist in a National Health Organisation.
TUBERCULOSIS ASSOCIATION
5 P.M. (26, Portland Place, London, W.1.) Dr. Brian Thompson: Primary Pleurisy with Effusion—Clinical and Epidemiological Features and After-history of 190 Cases.
8 P.M. Mr. W. T. Russell, D.SC., Dr. Norman England: Morbidity of Tuberculosis.

Births, Marriages, and Deaths

BIRTHS

BRAY.—On April 21, in London, the wife of Dr. John Bray—a son.
DAVIES.—On March 24, in Abadan, Southern Iran, the wife of Mr. E. R. Davies, F.R.C.S.—a son.
EDWARDS.—On April 30, at Leamington Spa, the wife of Lieut.-Colonel G. F. Edwards, M.B.E., R.A.M.C.—a daughter.
LING.—On April 2, at Roffey Park, Horsham, the wife of Dr. T. M. Ling—a son.
NEWSOME.—On April 27, at Tonbridge, the wife of Dr. John Newsome—a son.
NICHOLSON.—On April 27, in Manchester, Dr. Olive Nicholson (née Elkin), the wife of Mr. Alan Nicholson, F.R.C.S.—a daughter.
RICE.—On May 3, in London, the wife of Surgeon Lieut.-Commander David Rice, R.N.V.R.—a son.
SHEPHERD.—On April 28, at Oxford, the wife of Mr. John A. Shepherd, F.R.C.S.E.—a son.
SLOAN.—On May 3, the wife of Dr. D. R. Sloan—a son.
TODD.—On May 5, at Leicester, the wife of Dr. R. McLaren Todd—a son.
TURNER.—On May 5, at Woking, the wife of Dr. R. W. D. Turner, O.B.E.—a son.
WATKINSON.—On April 28, in London, the wife of Dr. Geoffrey Watkinson—a daughter.

MARRIAGES

BALL—WOODHOUSE.—On April 27, in London, Dr. Keith Ball to Francesca Woodhouse.
CULLIS—COLLETT.—On May 4, at Charlton Kings, Hugh Cullis to Dorothy Lawrence Collett (née Millar), M.B.
DUNKLEY—MOORE.—On April 26, in Edinburgh, Ernest Weightman Dunkley, M.B., to Edith Moore.
MILLER—LOCHÉE BAYNE.—On April 27, at Bexhill, Joseph Esmond Miller, M.C., major R.A.M.C., to Kathleen Veronica Lochée Bayne.

DEATHS

DAY.—On April 27, William Frank Lydstone Day, M.B. Camb., of Truro, Cornwall.
TURNER.—On April 27, in London, Rosa Turner, L.R.C.P.E., formerly of Gower Street, W.C.1.

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Notes and News

MAKING HOSPITAL APPOINTMENTS

THE Middlesex County Council has approved a new system of selecting candidates for the senior posts in its hospitals. For each appointment a small professional committee will be formed, composed of the medical director and some of the senior members of the hospital concerned, together with a few seniors from other hospitals in the county and the county medical officer of health. This arrangement was recommended as having three advantages: (1) a man holding a temporary appointment will be less likely to be preferred to a better man who is less known to the county authorities; (2) it will give confidence to the medical profession that appointments are made not only impartially but by expert assessors; and (3) as the county's hospitals are tending to become teaching centres, confidence will similarly be given to the University of London, which it is hoped will coöperate in the scheme.

As regards the junior appointments (those of house-officers and the like), an opposite course is proposed. These appointments have so multiplied that much time is wasted in assembling committees to deal with them. The Middlesex public-health committee has decided to leave them in the hands of the medical director of the hospital concerned, in consultation with the appropriate senior members of his staff. In the selection of candidates for the intermediate appointments (those of chief assistants, registrars, &c.) no change in the present procedure is contemplated.

RELEASE OF PENICILLIN

AT a press conference in London on May 1, Mr. John Wilmot, the Minister of Supply, announced that penicillin would be on sale to the public against a doctor's prescription in the near future—probably from June 1. It is also to be sold in lozenges and ointments; and it may be employed for veterinary purposes. The price to the public has not yet been determined. Production by deep culture, a method developed in the United States, is now proceeding in factories at Speke and Barnard Castle. Whereas the average monthly production in this country was 300 mega units in 1943, 3166 mega units in 1944, and 26,000 mega units in 1945, it had risen to over 260,000 mega units by last month. Potency, formerly 150 units per mg., and recently raised to 300 units per mg., has been still further increased, and much of the penicillin now produced exceeds 1000 units per mg.

A BRITISH-SWISS CONFERENCE

THE Swiss Academy of Medical Sciences is organising a British-Swiss medical conference to be held in Basle from Sept. 16 to 21. British doctors are cordially invited to participate and bring their families, for whose entertainment special arrangements will be made. An organising committee has been set up in England, under the chairmanship of the president of the Royal Society of Medicine, including representatives of the royal colleges, the Medical Research Council, the Physiological Society, the Pathological Society, and the British Council. A detailed programme of speakers and subjects will be announced later. Reservations are being arranged by Thomas Cook & Son, Berkeley Street, London, W.1, to whom applications should be sent before July 1.

AMERICAN TUBERCULOSIS STATISTICS

THE United States can show good results in the advancing control of tuberculosis.[1] In 1944 there were 54,123 deaths and 124,789 new cases, with a death-rate of 40·8 per 100,000. This may be compared with death-rates for 1943 of 61·9 in England and Wales, 78·6 in Scotland, 130·4 in Eire, and 47·1 in Canada. Between 1939 and 1943 the rate in England and Wales rose by 0·1 per 100,000, and between 1939 and 1944 it rose by 8·2 in Scotland and 17·8 in Eire. On the other hand in the United States and Canada between 1939 and 1944 the rates fell by 6·3 and 6·0—no doubt reflecting better feeding and living conditions. The low American rates show startling variations within racial groups. The negroes, at once poorer and more susceptible than the average white population, show high death-rates. Thus in New York City in 1944 the death-rate among the coloured population was 189 per 100,000, as against a rate of 35 among whites and a combined death-rate of 46. In New York the death-rate is higher among men (64·7 per 100,000) than among women (31·1), and deaths are most numerous among men aged 50–59 and women aged 20–29.

1. Tuberculosis Reference Statistical Yearbook, 1944. New York Tuberculosis and Health Association. 1945.

During the period 1939–44, there were no less than 350,103 deaths from tuberculosis in the United States, with nearly double that number of new registrations. This figure is seen in perspective when it is realised that American casualties during the war numbered 256,996 killed and 651,261 wounded.

CONVICTIONS FOR ABORTION

DURING the years 1939 to 1944, 600 people were convicted for procuring, or assisting at, abortions.[1] In 533 of the convictions instruments were used and in 67 drugs. The following table gives the number of medically qualified and unqualified persons involved:

Year	Number of convictions		
	Qualified	Unqualified	Total
1939 ..	2	65	67
1940 ..	1	52	53
1941 ..	0	66	66
1942 ..	2	101	103
1943 ..	4	158	162
1944 ..	5	144	149

University of Cambridge

On May 3 the following degrees were conferred:

M.D.—A. G. V. Aldridge (by proxy) and G. C. Tooth.
M.B., B.Chir.—R. W. P. Jackson, B. A. J. C. Gregory, R. N. Grabowsky-Atherstone, P. N. Magee (all by proxy), and A. H. Littlewood. *M.B.*—R. G. Orr (by proxy).

University of Edinburgh

Prof. James Rögnvald Learmonth, C.B.E., CH.M., F.R.C.S.E., has been appointed regius professor of clinical surgery. The chair has been vacant since Sir John Fraser, its former holder, became principal of the university.

A native of Kirkcudbright, Professor Learmonth was born in 1895, and graduated with honours at Glasgow in 1921, when he was awarded the Brunton memorial prize as the most distinguished graduate of the year. From 1922 to 1928 he worked as assistant to Prof. Archibald Young, first in the Anderson College of Medicine, Glasgow, and later in Glasgow University. In 1924, with a Rockefeller fellowship, he spent a year at the Mayo Clinic, to which he returned in 1928 with an appointment as neurological surgeon; he was also associate professor of neurological surgery in the University of Minnesota. In 1932 he succeeded Sir John Murdoch as regius professor of surgery in the University of Aberdeen, and in 1939 he was appointed to the chair of surgery in Edinburgh University. Professor Learmonth will be the first to occupy this chair combined with that of clinical surgery. He is surgeon to His Majesty's Household in Scotland, and a member of the Army Medical Advisory Board.

Association of Surgeons of Great Britain and Ireland

The annual meeting held in London early this week under the presidency of Sir Max Page was attended by a dozen surgeons from France and Belgium—Leriche, Bazy, Santy, Lortat-Jacob, Mathey, Berat, de Baiseux, Albert, Déjardin, Morelle, Segound, and Mayer. At the dinner at Claridge's on Tuesday night Sir Alfred Webb-Johnson, P.R.C.S., proposing The Guests, introduced them to the company by asking each to rise in his place. He spoke of the emotion felt at this reunion after long years of trial, and of the admiration of British surgeons for the patience and fortitude of their colleagues—their faith so difficult to keep burning, and their cold resolve. What at great risk they had done for our men would never be forgotten. Prof. René Leriche, in reply, related how in the difficult years he read the works of the older English surgeons, down to Astley Cooper, and was impressed by the essential unity of surgical thought. The need of surgeons today was to break down isolation—to meet and work in common. Responding to the toast of The Association, proposed by Sir Claude Frankau, Sir Max Page welcomed the return of international surgery: it was essential, he felt, to encourage interchange of ideas, cultivate good fellowship, and promote the science. Sir Alexander Hood, as director-general of Army Medical Services, testified to the achievements of surgeons during the late war. By its effect on the morale of the troops, efficient care of the sick had contributed enormously to victory, and the presence of specialist surgical teams near the front had an immense influence. A team spirit prevailed in the medical service, and the consultants had done much to improve results by spreading the latest gospel among the younger men. With the return of peace the medical branches of the Services did not want to go into a state of professional isolation: "we want to be mixed up with you."

1. *Hansard*, April 30, 1946, para. 7.

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University of Dublin

As announced last week, Mr. Adams Andrew McConnell has been appointed regius professor of surgery in the university in succession to the late Sir Arthur Ball.

Mr. McConnell was educated at the Royal Academical Institution, Belfast, and the University of Dublin. As an undergraduate he obtained the Trinity College scholarship in anatomy and the institutes of medicine. After taking a B.A. in 1906, when he was first senior moderator (large gold medal) in natural science, he qualified M.B. in 1909. He was appointed assistant surgeon to the Richmond Hospital in 1910, and was promoted to the senior staff in 1914. He held the post of lecturer in applied anatomy in Trinity College and the chair of surgery at the Royal College of Surgeons in Ireland. He became a fellow of the Royal College of Surgeons in Ireland in 1911 and was president from 1936 to 1938. Mr. McConnell was an original member of the Society of British Neurological Surgeons, of which he was president from 1936 to 1938. His earlier publications were on general surgical subjects, but the more recent have dealt with the surgery of intracranial lesions. The degree of M.CH. (honoris causa) was recently conferred on Mr. McConnell by the senate of Dublin University.

Northern Ireland Health Services

Subject to the approval of their parliament, the government of Northern Ireland have accepted financial responsibility for the provision of a site for a new hospital for Londonderry and the north-west area of Northern Ireland. Later, this hospital will take its place in the framework of a comprehensive national health service, which the government are determined that Northern Ireland shall have. The new hospital at Londonderry will ultimately have 400–500 beds, and a maternity section is to be provided first because of its special urgency.

Edinburgh University Club of London

The first postwar reunion of the club will take place at the May Fair Hotel, Berkeley Street, London, W.1, on May 29, at 6.30 P.M., when members may meet the president-elect, Sir John Anderson, F.R.S., and Lady Anderson. Any member not receiving his invitation by May 18 should communicate with the hon. secretary, Dr. Bruce Williamson, 12, Wimpole Street, W.1.

Royal Medico-Psychological Association

The next quarterly meeting will be held at the Retreat, York, on May 17. Speakers will include Dr. Gwendoline D. Knight, who will talk on Quaker Contribution to Psychiatric Thought and Practice; and Mr. G. F. Rowbotham, whose subject will be The Problem of Migraine as an Introduction to the Autonomic Nervous System.

Return to Practice

The Central Medical War Committee announces that Mr. J. C. F. LLOYD WILLIAMSON, F.R.C.S., has resumed civilian practice at 34, The Drive, Hove, Sussex. The committee regrets the error in the announcement of Mr. W. A. Mill's return to practice. Mr. W. A. MILL, M.S., F.R.C.S., is now in practice at 22, Harley Street, W.1 (Langham 1923).

London Students and the School Health Service

Students from St. Mary's Hospital are to attend L.C.C. school medical inspections and to visit the council's schools for physically and mentally handicapped children. The council's education committee favours the development of this arrangement with other voluntary hospitals, as was recommended in the Goodenough Committee's report.

Presentation to Mr. H. J. Nightingale

On his retirement from the staff of the Royal South Hants and Southampton Hospital, Mr. H. J. Nightingale has been presented with his portrait. Mr. Nightingale, who has been senior honorary surgeon for 14 years, has been appointed an honorary consulting surgeon and a vice-president of the hospital.

British Association of Physical Medicine

The annual general meeting will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on May 15, at 5.30 P.M. It will be followed by a dinner in the college.

Chemical Exhibition

An exhibition of recent chemical discoveries, which has been organised by Imperial Chemical Industries Ltd., is to be held at the Tea Centre, Lower Regent Street, London, S.W.1, from June 5 to 28. In the medical section, prominence will be given to the sulpha drugs, penicillin, and 'Paludrine.' Other sections will show chemistry's recent contributions to agriculture, the control of insects, the development of plastics, and the discovery of 'Ardil,' a wool-like protein made from monkey-nuts.

British Orthopædic Association

The spring meeting of the association will be held at Newcastle-on-Tyne on May 24 and 25.

Children's Moral Welfare Committee

The annual meeting of this committee, of which Prof. Alan Moncrieff, F.R.C.P., is chairman, will be held at St. Pancras Town Hall on May 23, at 5.15 P.M. The speakers will be Mr. D. R. Mace, PH.D., and Miss Glyn-Jones.

West London Medico-Chirurgical Society

Dr. G. S. Hovenden will deliver his presidential address, postponed from March 15, at a meeting at the West London Hospital, on May 17, at 8.30 P.M. He will speak on Fifty Years of General Practice.

Summer Schools on Healthy Living

The Scottish Council for Health Education is organising three residential summer schools on healthy living, two at St. Andrews and one at Edinburgh University. Inquiries should be directed to the council's secretary at 3, Castle Street, Edinburgh, 2.

British Association of Urological Surgeons

The annual general meeting will be held in London from June 27 to 29, mainly at the Royal College of Surgeons, Lincoln's Inn Fields, W.C.2, under the presidency of Mr. R. Ogier Ward. Thursday afternoon will be occupied by business and the consideration of a draft memorandum entitled A Urological Survey of Britain. On Friday there will be a discussion on the Treatment of Benign Enlargement of the Prostate, followed by operating sessions in the afternoon and a dinner at the college in the evening. On Saturday morning films of urological interest will be shown.

COMMONWEALTH FUND: *Corrigendum.*—Among the new grants from this fund mentioned in our issue of March 30 (p. 483) was one for the investigation of the possibility that "a specific toxin of cancer occurs in a hereditary pattern." This should have read "a specific form of cancer occurs in a hereditary pattern."

On Active Service

CASUALTIES

DIED

Lieut.-Colonel GILBERT WOLRIDGE ROSE, M.B. Aberd., R.A.M.C.

Major HAMISH BARROWMAN, M.B. Glasg., R.A.M.C.

Lieutenant J. EVANS, R.A.M.C.

Appointments

MACDOUGALL, I. A., M.R.C.S., D.P.H.: deputy M.O.H., and deputy school M.O., Bournemouth.

PERRY, K. M. A., M.D. Camb., M.R.C.P.: asst. physician (thoracic department), London Hospital.

RAVEN, R. W., F.R.C.S.: surgeon, Royal Cancer Hospital (Free), London.

RUSBY, N. L., D.M. Oxfd, M.R.C.P.: asst. physician (thoracic department), London Hospital.

SINTON, A. S. R., M.R.C.S.: police surgeon, Leeds.

STEVENSON, D. S., M.B.E., M.B. Glasg., F.R.F.P.S.: medical referee for the sheriff-court districts of Glasgow, Lanark, Hamilton, Airdrie, and Dumbarton.

Middlesex Hospital.—The following appointments have been made:—

BETTLEY, F. RAY, M.D. Lond., M.R.C.P.: physician for diseases of the skin.

GOLDSMITH, A. J. B., M.B. Lond., F.R.C.S.: asst. ophthalmic surgeon.

HANDLEY, R. S., O.B.E., B.CHIR. Camb., F.R.C.S.: asst. surgeon.

Norfolk and Norwich Hospital.—The following appointments have been announced:—

BENTALL, A. P., M.B. Camb., M.R.C.O.G.: asst. surgeon to obstetric and gynæcological depts.

BIRT, A. B., M.B. Lond., F.R.C.S.: asst. surgeon.

OLIVER, W. A., M.B.E., M.D. Lond., M.R.C.P.: asst. physician.

RICE, R. A. C., M.B. Lond., D.A.: anæsthetist.

RUTLEDGE, W. E., L.R.C.P.I., D.O.M.S.: ophthalmic surgeon.

SMITH, A. G., M.D. Edin.: dermatologist.

TOWNSLEY, N. J., M.B. Belf., F.R.C.S.: asst. surgeon.

Colonial Medical Service.—The following appointments are announced:—

AUSTIN, C. J., O.B.E., M.B. Edin.: M.O. (grade I), Fiji.

BECKFORD, J. H., L.R.C.P.E.: asst. M.O., Jamaica.

BOLAND, R. A., M.R.C.S.: M.O. (grade C), Trinidad.

CHWATT, Major L. J.: medical entomologist, Nigeria.

DATE, Miss A. T., M.B.: M.O. (grade C), Trinidad.

D'OFFAY, R. M., M.B. Edin.: M.O., Seychelles.

KELSICK, H. E., M.B. St. And.: supernumerary M.O., Leeward Islands.

PARK, Captain ROBERT, M.R.C.S.: M.O., Nyasaland.

RUSH, Major S. V., M.R.C.S.: M.O., Uganda.

WALCOTT, A. L., L.R.C.P.E.: asst. M.O., Jamaica.

WATSON, W. H., M.D. Glasg.: senior M.O., Nyasaland.

WINSTON, R. M., M.B. Manc.: M.O., Nigeria.

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ORTHOPÆDIC AND REHABILITATION SERVICE OF THE ROYAL AIR FORCE

H. OSMOND CLARKE
F.R.C.S.
AIR COMMODORE R.A.F., SERVICE CONSULTANT IN ORTHOPÆDIC SURGERY

Now that a National Health Service is imminent and planning is the order of the day, it may be helpful to describe briefly the Royal Air Force combined orthopædic-rehabilitation service. It forms part of a State-controlled medical organisation—the R.A.F. medical services—and it includes the first comprehensive scheme of rehabilitation to be introduced on a national scale. In my view this orthopædic-rehabilitation service is a working model applicable, with modifications imposed by local circumstances, to many if not all the regions into which it is proposed to divide this country.

The scheme was born in the grim days of the late summer and early autumn of 1940. The credit for its origin and development is due to Sir Reginald Watson-Jones, supported strongly by the Director-General of the Medical Services, Sir Harold Whittingham, and assisted with great ability and enthusiasm on the rehabilitation side by Dr. H. E. Moore and Group-Captain C. J. S. O'Malley.

At first orthopædic centres were established in the United Kingdom in five R.A.F. general (base) hospitals, with three geographically separate rehabilitation centres. Later the number of home-based orthopædic centres or subcentres increased to ten. The sites were chosen in relation to the local needs—e.g., some were in the heart of Bomber Command, others amidst large groupings of training depots, and so on. Each served a region in which the medical organisation consisted of the base hospital, one or more station hospitals, unit sick-quarters, and, in some, casualty air-evacuation sections. The whole scheme on the specialists' side was run by 2 consultants and a senior orthopædic specialist, all of whom travelled from place to place training junior colleagues and supervising treatment; 8 orthopædic specialists; and some 21 other surgeons of junior rank—about 32 doctors in all. In view of the number of patients, inpatient and outpatient, and the severity and complexity of the casualties, this quota of medical officers is not excessive.

RESULTS

In the five-year period 1941–45 inclusive, 62,210 inpatients were treated for major, often multiple, injuries, from the time of injury until maximum recovery, with no break in continuity of treatment. Outpatients during the same period numbered 153,472. Of the inpatients, 20,556 required treatment in special rehabilitation centres.

The success of the organisation can be judged by the fact that 77% returned to full duty, flying and other trades; 18% were retrained or returned to modified duties in the Service; and 4·8% were invalided because maximum physical recovery was insufficient for Service requirements, or perhaps because of psychological complications. The records of the patients treated in rehabilitation centres—i.e., the most severely injured group—show that the average period of disability per person was nineteen weeks, nine of which were spent in a rehabilitation centre.

GENERAL HOSPITAL

I have been greatly impressed by the completeness of the help which it has been possible to offer the patient in this orthopædic structure. Some idea of it can be gained from the facilities available to an injured airman admitted to a R.A.F. general hospital.

(1) *He has no immediate economic worries.*—His pay continues, and so do his family and other allowances. The great advantage of this economic background to the surgeon who starts and continues treatment must be emphasised.

(2) *He is treated in an orthopædic unit of about* 100–150 *beds by a team* of surgeons, nurses, technicians, and orderlies specially trained to restore him to maximum recovery in the shortest time. Every single member of the team must make at least two contributions: the exercise of professional skill, and the exercise of a cheerful confident personality which so inculcates the will to get well that apathy never develops. The aloofness of a surgeon may tilt the scales against his professional skill, however great that may be. One most skilful surgeon, known as "the Fuehrer" because of his unbending attitude, sent to our rehabilitation centres patients with straight limbs but with sadly warped minds. Another was an indifferent surgeon but a man of great personality, and he sent men with not so straight limbs but with a spirit which nothing could quell. The combination of these qualities is surely the hallmark of a good doctor, and in my experience it is one of the most important, if not indeed *the* most important, factor in rehabilitation.

Apart from skilled nurses, whose importance it is unnecessary to emphasise, the team consists of the following members:

(*a*) Three surgeons of different seniority, the most senior being of specialist rank corresponding in civil life to a very senior registrar or a junior consultant. The work of this team is under regular supervision by the two Royal Air Force consultants and the senior specialist in orthopædic surgery, who are also available at short notice in case of emergency.

(*b*) Radiographers, who provide a 24-hour service, well equipped with mobile X-ray sets. Radiographic control of fracture treatment is strict; no manipulation or change of plaster is left unchecked by radiography in as many planes as necessary to be certain of position and alignment ("economy" in radiograms is dangerous, a fact which will have to be faced realistically by voluntary hospitals).

(*c*) Clinical secretaries and clinical photographers, who ensure that complete records are available. A clinical photograph and prints of important radiograms are worth many pages of notes. One page of dictated typewritten notes is worth many sheets of illegible handwriting. These records follow the patient from hospital to rehabilitation centre, and from rehabilitation centre to hospital, so that there is unbroken continuity of his narrative. When treatment is completed and the patient returns to duty, the records are returned to his original R.A.F. orthopædic unit for scrutiny by the surgeons who were responsible for initial treatment. Thereafter they are stored in a central repository to be available for follow-up review.

(*d*) Rehabilitation orderlies, three to each 100 beds, specially selected and specially trained, who work under the orders of the orthopædic surgeons. They are chosen not only for ability but also and more particularly for personality. All candidates for these posts are selected personally by one of the consultants in orthopædic surgery. They must be bright, alert, and optimistic. Their duty is to ensure that every patient performs his exercises regularly for not less than five minutes every hour and to inspire the patient in a spirit of enthusiastic coöperation with the team. One orderly is posted to every ward. His principal duty is to give individual instruction to every patient, to supervise the hourly exercise of every patient in the ward, to promote a general spirit of enthusiasm, and to organise games and recreations in convalescent rooms, solaria, and hospital grounds. I find it impossible to emphasise too much the importance of ward-rehabilitation orderlies and of their influence in restoring and maintaining morale. In the Royal Air Force they were selected mainly from the group of trained nursing orderlies, but in the future they will probably be hand-picked members of the Chartered Society of Physiotherapists.

(*e*) Welfare workers, some voluntary and some specially trained, organise occupational therapy, leather work, and other diversional pursuits, provide a good library, and arrange concerts, lectures, and cinema entertainments. It is also to be remembered that patients have relations who play an important part in their lives; wives have babies; parents

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suffer illness; members of the family die; fiancées become estranged. To minimise the anxieties which are inseparable from these events there are generous visiting facilities.

(3) *All specialist services are readily available.*—I am constantly impressed in the R.A.F. medical service by the speed with which a competent specialist's opinion can be obtained—usually within a day. When a patient waits many days for further opinions, with varying degrees of apprehension, there is not only a waste of beds but also a lowering of morale. These delays were a conspicuous feature of pre-war hospital life.

A lesson which has been emphasised strongly by R.A.F. experience is the importance of close liaison between orthopædic and plastic surgery. Units organised by the civilian consultant in plastic surgery, Mr. A. H. McIndoe, have made an important contribution. Patients do not spend weary months waiting for wounds to heal by granulation. Secondary suture, excision of scars, and skin grafting allow the orthopædic surgeon early access to the primarily difficult or to the late ununited fracture. Young orthopædic surgeons in the R.A.F. have been trained in first-aid plastic surgery. It is most important that every surgeon who deals with accidents should be given such training, so that wounds can be covered with skin before infection supervenes.

REHABILITATION CENTRES

Through the help of the British Red Cross Society it was usually possible to have one of their hospitals near each R.A.F. orthopædic centre for use as a primary rehabilitation unit. A masseuse and a rehabilitation orderly carry out a regime of treatment similar in principle to that in the larger R.A.F. centres but on a smaller scale. This B.R.C.S. help is of great value in freeing hospital beds and in providing treatment for those not yet fit to go to the larger centres, and who would otherwise have to be sent on sick-leave. From these small efficient units many men return to their units to full duty.

At the end of treatment in the hospital or primary rehabilitation unit about a third of all patients are transferred by road or air ambulance or by train to an R.A.F. rehabilitation centre. Six centres, totalling over 1000 beds, were established to accommodate different groups of patients: (1) officers, aircrew and others; (2) N.C.O. aircrews; (3) technicians (electricians, fitters, armourers, &c.); (4) ground staff (unskilled); (5) W.A.A.F. personnel; and (6) returned prisoners-of-war. This division worked well. On the whole, aircrews are younger; they are trained to be aggressive in the highest degree, and unless wisely handled they are liable to project this aggression to doctors, hospitals, and rehabilitation centres. Compared with technicians, their outlook, pursuits, and hazards are different. Technicians are older; they are highly skilled tradesmen; they require different handling and a different approach. It is clear also that injured women and, still more, returned prisoners-of-war require special handling. But there is a common pattern in the facilities and programme of work at all the centres.

By rehabilitation a man is restored mentally, physically, socially, and technically to his former state, and treatment should usually follow that sequence. It is convenient to describe the organisation of R.A.F. rehabilitation centres under three headings—mental, physical, and technical.

(1) *Mental Rehabilitation.*—The maintenance of high morale is one of the most important factors in restoring health. I am convinced that successful treatment is three-fifths mental and two-fifths physical. The rehabilitation unit should not be far from a town and preferably a seaside resort—far enough to be seclusive, near enough to allow easy access to the amenities of the resort.

If the patient has been well handled in hospital, he does not arrive at the rehabilitation centre in a spirit of apathy, suspicion, and hostility. Nevertheless, his reception must be warm and efficient; first impressions are lasting; there must be no hanging about; he must go straight to a receptionist, who provides him with full information of the whereabouts of his bedroom, the daily routine, the time of local trains and cinemas, and the general plan of organisation.

The staff must have ability and enthusiasm, the atmosphere must be jolly; it must combine real endeavour with fervour; there must be little of the cold logic of a scientific laboratory. There must be a library, brains trust, and organised lectures and discussions. The evening programmes should be a judicious blend of light and intellectual activities—dances (which mean a band), cinemas, concerts, &c. Woodwork and metal workshops for diversional purposes in off-duty hours are very popular.

Social interchange calls for a moderate quota of alcohol, and if this is not provided in the centre it will be secured elsewhere with perhaps less desirable results. A bar, with a reasonable ration of beer or light wines, was originally considered revolutionary, but in R.A.F. rehabilitation centres it has proved its worth. It must be furnished tastefully. As a colleague puts it: "decoration and environment condition the behaviour of the patient, and a four-ale bar with sawdust on the floor induces the behaviour which is normally found in such a bar."

As in hospital, the contact of patients with friends and relations is maintained by visits and by judicious periods of week-end leave. A sense of citizenship is developed by visits to factories, mines, and other industrial activities. Patients see how their fellow-men live; they appreciate the efforts made during war; they gain much in mental and social equipment.

(2) *Physical Rehabilitation.*—Each unit has more or less the same set-up of gymnasia, swimming-pools, playing-fields for games and exercises, tennis courts, squash courts, volley-ball courts, and so on—the whole in bright cheerful attractive surroundings. The subsoil should be sandy to allow good drainage and drying, so that outdoor games and exercises can be undertaken regularly even in the changeable weather of this country. The extent to which the grounds are available for exercises and games is of significance in determining how much gym space is required. Broadly speaking, for 250 patients, about a third of whom at any one moment will be in too early a stage for gym work, a gymnasium 140 ft. × 80 ft. × 40 ft. affords sufficient room for exercises and indoor games and for annexes for consulting-rooms and physiotherapy. Sleeping accommodation in small dormitories and good messing facilities are essential. They are close to the scene of the day's activities.

To cope with 250 patients and allow for periods off duty through illness, leave, or attendance at refresher courses the following team, reinforced by regular visits of the consultants or specialists in orthopædics, is required to maintain efficiency:

Doctors: 1 senior and 3 junior medical officers. (This ideal of about 60 patients to each M.O. was never achieved because of the general shortage of doctors.)

Physical fitness officer: 1.

Masseuses: 9 (or 6 masseuses and 3 rehabilitation orderlies).

Physical training instructors (P.T.I.): 12.

After trial of many methods patients were divided into three flights, each with three subgroups:

"A" flight (tibia, ankle, and foot) } divided into { Non-weight-bearing, Medium ,, ,, Full ,, ,,
"B" flight (knees and femurs) }

"C" flight (arms and spines) divided into { Early, Medium, Late

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It is sometimes necessary to establish a small separate group of backward patients for individual attention. Each flight has 1 medical officer, whose team consists of 2 masseuses (or 1 masseuse and 1 rehabilitation orderly) for non-weight-bearing leg or early arm cases; 2 P.T.I. for medium-weight-bearing leg and medium arm cases; and 1 P.T.I. in charge of the late arm cases.

Each P.T.I. remains with his group throughout the day, instructing and encouraging them in their exercises and joining in their games. A backward patient receives more individual attention. It has been found that after general training in the work of a rehabilitation centre a P.T.I. will prove himself more competent in one sphere of activity than another. For example, an instructor may be almost useless in the individual remedial work required in intermediate groups but ideal in the handling of fully active groups. It is advisable to encourage at least a degree of specialism, and it is certainly unwise to change instructors from one group to another too often. The optimal period of control of a single group is about 9–12 months.

A physical fitness officer, who is usually a commissioned P.T.I. of outstanding quality, is responsible for coördination of the work of all P.T.I. in the centre. He acts as intermediary between doctor and P.T.I.; he spends his day in the gymnasium and playing-fields and exercises general supervision.

Patients are supplied with appropriate gym kit. A programme is so arranged that overtiring and monotony are prevented. Each period of 20-min. activity is followed by 10-min. rest and relaxation (or 30-min. work by 15-min. rest). The original ratio of 40-min. work to 20-min. rest proved too exhausting. Each group is changed from a period of remedial activity to, for example, cycling, then swimming, then games (net-ball, volley-ball, football), rambles, and so on. From three to four hours a day is thus spent in active physical endeavour of varyingly strenuous degree. We have found this to be the greatest physical activity which can be tolerated with advantage during one day.

(3) *Technical Rehabilitation* (*Retraining*).—It soon became apparent that no medical officer could hope to be acquainted intimately with all the details of flying, wireless operating, navigation, gunnery, and every type of highly skilled technical trade Thus, even when physical rehabilitation was far advanced, it was often difficult to know whether or not a man was fit for all the intricate details of his work. Further, when incapacity lasted many months, every man lost touch with his technique and became stale; at whatever stage he returned to duty, refresher courses were needed. These two problems were solved by providing, at each rehabilitation centre, hutments which included representative sections of various trades, each with trained instructors—the vocational wing. After using these wings as occupational and vocational adjuncts, it became possible to estimate their value. Generally speaking, aircrews could maintain their proficiency and keep themselves up to date. In ground trades, however, technical facilities in the rehabilitation centre were of value only when maximal or nearly maximal physical recovery was achieved. Refresher courses in the workshop allowed medical officers in collaboration with instructors to estimate the degree of technical recovery and to decide whether or not limitation of industrial activity was desirable.

RESETTLEMENT

The airman whose recovery is complete presents no problem in disposal. It is when he is adjudged unfit for his full previous duties that difficulties arise in resettlement. These problems are determined while the patient is still under treatment in the rehabilitation centre. It is at this stage, above all others, that break in continuity of treatment and control is to be avoided at all costs. The R.A.F. has such a wide variety of trades that almost every patient with a persistent disability can be accommodated in useful work. Further, the usual routine and hardships of Service life can be ameliorated by suitable alterations in category. Thus no more than a very small fraction of injured airmen were invalided out of the Service. Even after most complicated and difficult multiple injuries resettlement within the Service was usually achieved.

The position may be summarised thus:

(1) If disability was permanent and severe enough to prevent the airman continuing his former work, he was remustered and trained in a fresh trade within his physical and mental capabilities; in exceptional cases he was invalided.

(2) A special department of Air Ministry maintained liaison with the Ministry of Aircraft Production for the temporary employment of airmen with burns or orthopædic injuries whose recovery would be long delayed, or in whom a course of operations at long intervals would be needed. The men remained in uniform and received full Service pay and allowances. This department also found employment for and otherwise assisted men who were invalided from the Service, regardless of the fact that they were usually awarded State pensions.

CONCLUSIONS

Many old lessons have been reinforced and strengthened by R.A.F. experience:

(1) Team-work is essential. The right man should be "hand-picked" for the right job. Every member of the team has a dual task—the exercise of professional skill and the exercise of a cheerful confident personality.

(2) There must be unification of control of the patient from the beginning to the end of treatment, including regular supervision in rehabilitation centres. *The unity of control is that of team rather than of an individual.*

(3) Good surgery and good rehabilitation are of equal importance. The art, as well as the science, of "good doctoring" must be used to inspire and maintain confidence.

(4) Patients are ready to accept treatment in residential rehabilitation centres, even after long spells in hospital, provided there are adequate facilities for maintaining occasional but regular contact with relations. This readiness is not due solely to Service discipline.

(5) Not more than a third of all injuries require rehabilitation in residential centres.

I would like to express my thanks to the administrative medical officers of the R.A.F. of all ranks for their coöperation; and to acknowledge with gratitude the devoted and uncomplaining application to duty, and the zeal, of every member of the R.A.F. orthopædic-rehabilitation team.

. . . "One of the more important properties of hormones is that they are not species-specific in their action. This lack of zoological specificity extends far beyond mammals. Almost all the hormones studied in mammals appear to be present in the lower vertebrates, birds, frogs and toads, reptiles, and fish, and to have in these animals functions and effects similar to those seen in mammals. Moreover, preparations from mammalian sources give effects in the lower vertebrates analogous to those seen in mammals. . . . The pituitary hormone, prolactin, . . . in mammals is associated with activity of the mammary gland; in birds it causes broodiness, and in a more specialised way the thickening of the walls of the crop which results in the production of pigeons' 'milk.' This hormone is known to occur lower down the vertebrate tree, and it may perhaps be associated with the peculiar brooding habits found in amphibia and fishes. The evolution of endocrine activity seems to have depended on particular organs or functions becoming sensitive to particular substances, and it may well be that the substances we now know as hormones appeared casually in the course of evolution before they acquired a function. Such a process might still be going on. Would it be too much to say that the biochemical by-product of to-day is the hormone of to-morrow?"—Mr. A. S. PARKES, SC.D., F.R.S., addressing the Royal Society of Arts in London on May 8.

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LIPODYSTROPHY AND HEPATOMEGALY WITH DIABETES, LIPÆMIA, AND OTHER METABOLIC DISTURBANCES*

A CASE THROWING NEW LIGHT ON THE ACTION OF INSULIN

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THE pathological changes in the case reported here are strange enough, but the metabolic disturbances are so unexpected and unique as to throw a new light on the interrelationship of carbohydrate and fat metabolism and on the action of insulin. Our knowledge of this relationship, obtained mainly from the study of diabetes in animals and man, has expanded and changed greatly in recent years, and I shall first attempt to outline the present position as I see it, partly to point the strange contrast in the case to be described.

Defects of carbohydrate and fat metabolism are most clearly seen in severe and wasting diabetes. The disturbance in carbohydrate metabolism is more obvious, and the failure to store and burn sugar is certainly the *primary* defect, producing the characteristic hyperglycæmia, glycosuria, and wasting from loss of sugar. This is essentially due to defective production of insulin. In all experiments which produce severe diabetes in animals, whether by pancreatectomy, Young's (1937) pituitary extract, or alloxan, the islets are destroyed and insulin production fails. Histological damage to the islets is not always so obvious in human diabetes, but we may be equally sure that insulin is defective, because an adequate injection completely rectifies the diabetic state as long as it acts. Its most obvious action is hypoglycæmic, reducing the blood-sugar. How it does so and the fate of all the disappearing sugar are less exactly known. Experiments show clearly that insulin increases the tissue use of sugar and the storage of glycogen in the liver and muscles, but only when plenty of glucose is available and not at hypoglycæmic levels. The main stimulus to insulin secretion is the hyperglycæmia from digested carbohydrate, and the function of insulin is to make this sugar available.

At the moment the only hypothesis which explains all the experimental and clinical observations on insulin is that it facilitates the passage and penetration of excess blood-glucose into cells and enables these cells to use sugar in the various ways their innate nature and function require. What exact chemical process it catalyses, whether phosphorylisation or otherwise, is not clearly known. But in facilitating the use of sugar it turns the total metabolism preferentially to the use of carbohydrate and spares the use of protein and fat.

From this primary carbohydrate defect arises the important *secondary* disturbance of fat metabolism, manifested by the appearance in the blood and urine of the ketone bodies, oxybutyric and diacetic acid, and acetone. These are a striking and the dangerous feature of severe diabetes, leading to clinical signs of ketosis and ultimately to coma. It has long been known that these bodies appear during the processes of fat-catabolism in starvation as well as in diabetes.

It was, and is, accepted that fat is carried from the depots in the blood to the liver, which turns it into ketone bodies by β-oxidation or some such chemical step. Formerly it was thought that, for the further combustion of ketones to CO_2 and H_2O, the simultaneous combustion of glucose was necessary. We were all brought up on the phrase "Fat burns in the flame of carbohydrate," which implied an actual chemical reaction between the two whereby the combustion of one molecule of glucose burned three of fatty acids, a figure on which the carbohydrate-fat ratio, the ketogenic-antiketogenic ratio, in many diabetic diets was built in pre-insulin days. This, though ingenious, has been firmly superseded by the following new conception.

It has been proved that without the intervention of carbohydrate the ketone bodies formed in the liver are burnt directly in the muscles, in normals and diabetics alike, and are readily used as fuel in energy production. Fat does not burn in the flame of carbohydrate, but this flame stops the need for burning fat. Ketosis develops whenever insufficient carbohydrate is available and fat-catabolism has to provide the fuel requirements of the body. It is practically only in diabetes that ketone formation is so excessive as to cause acidosis and ketone poisoning, and this formation rapidly ceases when injected insulin makes carbohydrate available again. Ketosis is not an abnormal disturbance of fat-metabolism but an exaggeration of one of the normal processes of fat-catabolism. It is probably an emergency path for the speedy catabolism of fat. This new conception and the knowledge that ketones are good fuel explain many previous puzzles, including the relative muscular fitness of diabetics on high-fat and low-carbohydrate diets. It makes the old unsettled controversy over the conversion of fat into sugar rather stale and unnecessary.

I have purposely omitted different types of clinical hyperglycæmia at present grouped under the generic title of diabetes. For instance, the mild obese type of diabetes, in which the patient, though loaded with sugar, never develops ketosis may well be the result of some other process than insulin deficiency, as I shall suggest later.

Case-record

In May, 1936, an unmarried Englishwoman, aged 26, consulted our skin department about a rash which had been present for two months, mainly on the arms, knees, and neck. This was recognised as papular xanthomatosis; heavy glycosuria was discovered, and she was referred at once to the diabetic clinic for treatment. Here a pale clear urine was found to contain 6·4% of sugar, *no ketone bodies*, and a moderate cloud of protein on boiling. The blood contained 364 mg. of glucose per 100 ml.; cholesterol 417 mg. per 100 ml.; and total fat 6 volumes % (lipocrit), which separated as a thick cream on standing. She was admitted to hospital for treatment and investigation of the diabetes and lipæmia.

In childhood she had had mumps and German measles but no serious illness in all her life. There was no family history of diabetes or metabolic disease. She was an only child; her mother, aged 65, was alive and well; and her father had died at 52 from "encephalitis."

The history of her present illness showed classical diabetic symptoms for nine months, with loss of 12 lb. in this time and with a xanthomatous rash for two and a half months. Otherwise she felt energetic and fit for her work as a telephonist. Menstruation was regular and normal. Clearly, diabetic symptoms preceded overt manifestations of lipoid disturbance by many months. The normal appearance of her photograph (fig. 1) taken four years earlier makes it unlikely that her disease was of very long standing.

Fig. 1—Normal condition of patient in 1932.

Physical examination showed nothing abnormal (pulse-rate 70 per min.; blood-pressure 110/70 mm. Hg) except lipæmia retinalis, widespread maculopapular xanthomatosis, and general thinness. In a 3-in. wide encircling area of the right upper arm 120 of these spots were counted (fig. 2). The knees and the neck were also richly covered with the slightly raised yellow macules, without any inflammatory ring, but the rest of the body was unscathed. No enlargement of the liver and spleen was present at first.

* The Oliver-Sharpey lectures delivered at the Royal College of Physicians of London on March 19 and 20, 1946.

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In hospital the diabetes rapidly cleared on only 20 units of soluble insulin daily, and she returned to work in a week feeling well and gaining weight. She needed more insulin soon, 50 units a day, and in four months the skin rash had disappeared, although slight lipæmia persisted. She was not seen again for over a year, when in January, 1938, she was noted to have a bulging abdomen and very *large liver and spleen*. By the end of the year the basal metabolic rate (B.M.R.) was unexpectedly found to be very high, and progressive *lipodystrophy* became more and more obvious.

CLINICAL AND PATHOLOGICAL FINDINGS DURING LIFE

In spite of many abnormalities her general health and vigour remained surprisingly good throughout her long illness. Her muscles were unusually well developed and strong for a woman, even when one remembers how lipodystrophy accentuated her muscularity.

The discovery of a *large liver and spleen* in 1938, eighteen months after the patient was first seen, introduced a new element of interest. From her story this enlargement had been coming on gradually for some four months. The liver edge was felt at the umbilicus, and the spleen 1 in. below the costal margin. This was confirmed accurately by radiography, which also showed considerably *enlarged kidneys*. The liver and spleen gradually became bigger, but so slowly that monthly examinations showed little difference. Ultimately the liver filled most of the abdomen, the right border being lost in the iliac fossa, and it extended 3 in. below the umbilicus (fig. 3). It was smooth, firmer than a fatty liver, less hard than a cirrhotic one, and never tender. It seemed to increase a little in size and firmness during severe lipæmic phases, and the patient's feelings of fullness seemed to confirm this. *Liver puncture* produced only a very small

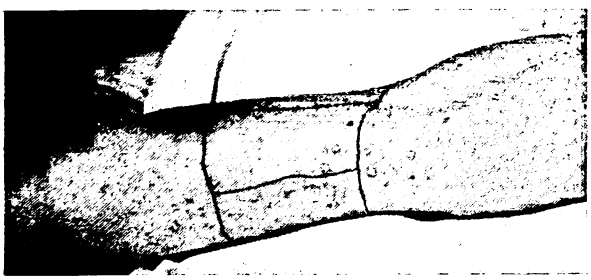

Fig. 2—Right arm showing maculopapular xanthomatosis in 1936.

sample (some five lobules) which looked normal in the fresh state but was too small to stain.

The *spleen* also increased very slowly and ultimately reached 1 in. below the umbilicus. It was much firmer than the liver but also smooth and not tender. Three *splenic punctures* produced nothing but blood and merely showed its tough consistence.

Liver-function tests remained normal. No suspicion of jaundice; no dilated veins; cholebilirubin was never present in the Van den Bergh test, which gave 0·2–0·4 unit of hæmobilirubin per 100 ml. in five estimations between 1938 and 1943. The *lævulose-tolerance test* was carried out by half-hourly separate estimations of the total blood-sugar and lævulose after 50 g. given at zero and another 25 g. at two hours. The following figures in mg. per 100 ml. show a normal function of the parenchymatous cells:

	Lævulose 50 g.				*Lævulose 25 g.*		
	Fasting	½	1	1½	2	2½	3 hr.
Total blood-sugar ..	247	266	286	270	266	266	250
Blood-lævulose ..	3·1	4·2	6·6	—	2·1	2·2	4·9

The *kidney function* too remained normal. The urine always contained a trace of protein on boiling, and occasionally quite a heavy precipitate, but no other chemical abnormality except sugar. The deposit occasionally showed a few hyaline, and once some granular, casts. No abnormal fat or doubly refractile particles. The blood-urea always remained 34–42 mg. per 100 ml., and the urea clearance in 1938 was 120% of normal. The renal threshold for glucose was normal.

No symptoms of disturbance of the *alimentary* system were present, apart from constipation when the diabetic phases were worst. Then the appetite, always big, became enormous. Hypochlorhydria was present (1940) with 20 and 30 c.cm. of N/10 total acidity respectively before and after histamine and a complete absence of free HCl. The fæces were normal in colour and consistence and never looked fatty. Microscopical examination showed well-digested muscle-fibres, no starch granules, no visible excess of unsplit or split fats, and hence no evidence of external pancreatic deficiency. Their chemical content is described below.

Menstruation was normal and regular before and during 1936–37; hence gonadal or pituitary upset of sex function was not a primary feature. In 1938 menstruation came on only every 3–4 months. In 1939 only three periods were missed, but for three years, since February, 1940, there had been no menstruation. Her strong muscularity and general thinness suggested masculinity, but the urinary androsterone was normal at 8·7 mg. per 100 ml. The distribution of hair remained of the feminine type, and in my opinion the severity of the diabetes or metabolic disturbance was alone sufficient to produce the amenorrhœa.

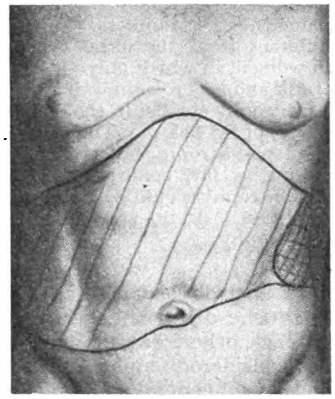

Fig. 3—Condition of patient in 1938, showing surface-markings of liver and spleen.

The *blood-picture* was essentially normal except for an increasing lymphocytosis, which reached 57% of the total 5000–8000 white cells per c.mm. (polymorphs 32%). She belonged to group N. The platelets, red-cell fragility, and clotting-time were normal, and a sternal puncture undertaken to exclude Gaucher's disease showed a normal marrow. Analyses of all the organic and inorganic chemical elements, including the proteins, carotene, diastase, and phosphatase, were within normal limits. The Wassermann reaction was consistently negative, but the sedimentation-rate was persistently high from 1938 onwards—i.e., 67–80 mm. in the first hour.

Radiography of the entire bony system, including the sella turcica, showed no abnormality, and the skin and mucosæ showed no abnormal pigmentation. After seven years of excess of blood-sugar and blood-cholesterol no arteriosclerosis or retinal hæmorrhages developed.

The *parotid* glands were enlarged and hard since 1938, becoming more obvious as lipodystrophy developed, and I felt that their prominence might be explained by the lipodystrophy. Later the palpable parts of the parotid and the submaxillary glands were stone-hard; hence pathological change became certain. A sialogram showed no obstruction, and the changes found at biopsy are detailed below. This biopsy was primarily undertaken in the hope of throwing some light on possible changes in the pancreas, the two glands being structurally similar. Although the secreting alveoli were almost completely replaced by duct tissue, saliva was still secreted. Chemical tests showed the presence of thiocyanate, and sufficient ptyalin was present to hydrolyse a starch solution fairly rapidly.

Pathological report (February, 1940): "The *parotid* gland is extensively infiltrated with lymphocytes and a few plasma cells. Secreting acini are practically absent and have been replaced by proliferated ducts, some of which show dilatation. A little fat could be demonstrated in the cells lining the ducts and free in the duct lumina, but fat storage is undoubtedly not responsible for the enlargement of the gland. The histological appearance suggests that this is due to blockage of the secretory ducts. The evidence for blockage of the secretory duct, however, seems sketchy and presumably rests on the apparent atrophy of gland acini. The *skin* excised from the parotid region shows no abnormality, but no subcutaneous fat can be seen."

The *lymph-glands* in general were slightly enlarged and firmer than normal, and an inguinal gland showed the following histology (1940): "The lymph-gland shows reactive hyperplasia with proliferation of sinus endothelium, and there is also a considerable amount of central fibrosis. Fat can be seen in the blood-vessels, and a little has been stored in the reticulum cells and histiocytes of the medulla of the gland and in some of the sinus endothelial cells. Fat storage, however, seems to be coincidental with the lymph-gland enlargement and not responsible for it. The section of the *skin* shows a normal amount of fat in the cells of the *sebaceous* glands, but no subcutaneous fat can be seen."

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Type of Lipodystrophy.—Her appearance was the only feature of her illness which distressed the patient and drove her out of employment to shelter in hospital. This feature was not obvious on diagnosis in 1936, but it was noted five months later that, although weight had been gained, "the face remained thin." This leanness spread and became more striking, and by 1939 a complete absence of subcutaneous fat in the face, neck, and shoulder girdles had developed, accompanied by a thinness everywhere (fig. 4). This is very different from the usual type of lipodystrophia progressiva in women, in which only the upper parts waste and the lower trunk and legs remain well nourished or even obese. Although her atrophy started in the face, she never had a compensatory excess of fat below. The unusual feature of her type was not the facial atrophy but the ultimate complete absence of subcutaneous fat, confirmed by biopsy and later at autopsy. Lipo-atrophy would be a more accurate term for her ultimate condition. At no stage did she show any localised insulin fat-atrophy.

METABOLIC DISTURBANCES

It is probably misleading to deal with the various metabolic disturbances separately, as they clearly react on each other, but for purposes of description they will be considered under the headings of carbohydrate, lipoid, and general metabolic upsets.

Carbohydrate Disturbance.—The diabetic condition appeared quite ordinary at first and responded completely to some 20 units a day when first treated in 1936. It soon required 50 units a day to obtain the same control, a fairly average dose for a diabetic of this age, working and probably indulging in some irregularities in diet. The insulin requirements gradually increased and were kept at 140 units a day in 1938 and 1939, while the effect of many variations in diet was being studied, without obtaining any full control of the diabetes.

In 1940, on a diet of carbohydrates 300 g., proteins 70 g., and fats 100 g. (glucose equivalent 350 g.), 400 units of insulin was given daily for some months; and, although a positive carbohydrate balance was maintained, an excretion of as much as 150–250 g. of glucose was found with an average glucose/insulin equivalent of about 0·5 g. per unit. Insulin, however, was not without effect; for, when all injections were stopped—with some trepidation—the glucose excretion rose to over 300 g. (still slightly positive total glucose balance) and the hyperglycæmia to more than 500 mg., thirst and polyuria became intense, and 10 lb. was rapidly lost in weight, which was soon regained on resumption of insulin.

An intravenous insulin-sensitivity test (Himsworth) showed evidence of this; and, although the arterial sugar curve rose as it should not do in a truly insulin-sensitive case, the venous sugar fell steeply 15 min. after insulin and showed a strong effect of insulin in the peripheral use of sugar. In all circumstances, too, the high fasting blood-sugar was reduced to a considerably lower level some four hours after a dose of insulin. Later, insulin was given intravenously to see if it would act more powerfully, and the following typical result shows a decided but brief depression of blood-sugar after 120 units of insulin followed by breakfast containing 65 g. of carbohydrate:

		Insulin 120 units i.v.					
	Fasting ↓	½	1	1½	2	2½	3½ hr.
Blood-sugar	520	434	363	324	370	356	392 mg. per ml.

No anti-insulin substance could be demonstrated in the patient's plasma by insulin-depression curves on rabbits. These were carried out in 1939 and 1941 by the very thorough technique of Gray and Oakley (1946), whereby 60 ml. of plasma is injected over four days and two depression curves are done after 0·2 unit of insulin given intravenously. A course of œstrogen (stilbœstrol 2 mg. four times a day) made no difference to her insulin requirements. While she was on doses of 400 units a day, no excretion of insulin was observed in her urine as tested by a technique capable of estimating 0·5 unit in 100 ml. of urine (Cutting 1942).

Since the patient's main anxiety was to gain weight to cover her distressing facial appearance, she was put on a very high diet: carbohydrate 300 g., protein 120 g., fats 200 g. (3500 calories), with 160 units of insulin b.d., without any attempt fully to control the diabetes. On this she gained 14 lb. and felt energetic and happy, although excreting 150–200 g. of sugar a day.

In November–December, 1940, it was decided to see how much insulin was necessary to control the diabetes on this diet, and what its effect would be; 120 units, later 160, was given four times a day, and later eight times a day, with the result that the blood-sugar fell to about 200 mg. per ml. and the amount of glucose in the urine to 80 g. a day. Ultimately insulin was given three-hourly day and night, 320 units when the urine contained much sugar, 240 when traces were present, and 160 units when the urine, tested three-hourly, was sugar-free.

For ten days a minimum of 1680 and a maximum of 2160 units was given on this ruling, and no hypoglycæmia developed, but the sugar excretion fell to some 15 g. a day. After an unexplained attack of fever (temp. 102°–104° F) hypoglycæmia developed, although all the diet was eaten, and the insulin had to be reduced to some 600 units. For the next month 1000–1600 units daily sufficed to keep the blood-sugar normal and the glucose in the urine at 0–10 g. a day, and to our surprise the lipæmia disappeared and the blood-cholesterol level became normal.

The dietary carbohydrate was then cut from 300 g. to 120 g. to make sure that the full utilisation of 300 g. had not caused the disappearance of the lipæmia, and now 700 units a day controlled the diabetes, and the lipæmia still remained absent. Next the carbohydrate was raised again to 300 g., and the insulin requirement rose to some 1100 units. Then the insulin was much reduced to allow a diabetic relapse, but this did not become heavy (100–150 g. of glucose in the urine a day) until the insulin was reduced to a very low level, 80 units a day. On this lipæmia rapidly recurred, 3–4%, and was not lowered by the substitution of vegetable for animal fat or by the reduction of the dietary fat from 200 g. to 70 g. a day. Again, in December, 1941, a lipæmia of 6% was abolished by raising the insulin from 240 units to 640 units a day, which fully controlled the diabetic state at that time.

Throughout these observations it was clear that the carbohydrate intake directly affected the glycosuria and the amount of insulin required to control it, but changes in the fat-intake from 100 g. to 10 g., and later from 200 g. to 70 g., showed no influence on the diabetic condition as judged by the sugar excretion or glucose/insulin equivalents. It was clear too that although unusually high doses of insulin were necessary they produced quite usual effects on blood-sugar and weight.

Ketosis, usually the surest indication of a severe diabetic condition, has been strikingly absent in this case. This was most clearly seen in May, 1940, when the effect of suddenly stopping 400 units of insulin a day was watched, on a diet of carbohydrates 300 g., proteins 60 g., and fats 10 g. All other cases of "diabetes" I have observed would have rapidly developed intense ketosis and plunged into diabetic coma. This omission of insulin changed a positive carbohydrate balance of +200 g. to a negative balance of −28 g., but Rothera's nitroprusside test remained negative (if the glucose from the protein is calculated, the total carbohydrate balance was positive by some 5 g.). When, however, the carbohydrate balance was made more negative (−55 g. of glucose) by reducing the dietary carbohydrate from 300 g. to 120 g., Rothera's test became strongly positive, but the ferric-chloride test remained negative. Next the carbohydrate was put back to 300 g., and the ketosis fell to minimal traces and was not appreciably increased by an increase of fat to 100 g. and later to 200 g. a day in spite of a heavy lipæmia. On three other occasions when the diabetes was specially uncontrolled (once during a dental abscess and a simultaneous emotional upset), a transient severe ketosis developed. On another occasion, during

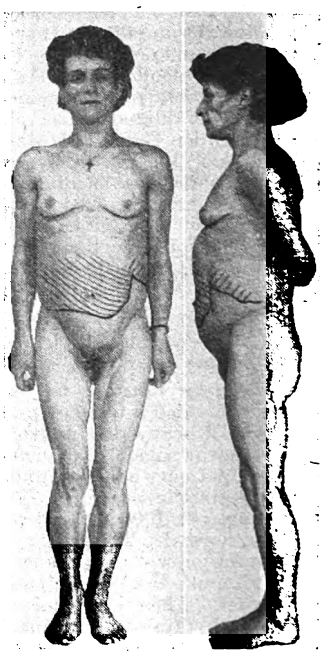

Fig. 4—Condition of patient in 1940, showing surface-markings of liver and spleen and the lipodystrophy.

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a B.M.R. test with no insulin for sixteen hours, a transitory ketosis was present.

The ketosis never had any direct relation to the degree of lipæmia. It seems clear that ketosis could be produced by a heavily negative carbohydrate balance, but with much greater difficulty than in most diabetics or even normals. Ketone bodies are known to be produced entirely in the liver, and it may be that her enormous liver had lost the power of catabolising fats to ketones, or more likely that she had no depot fat to mobilise.

Lipoid Disturbance.—A xanthomatous rash was the presenting symptom, and cholesterolæmia and lipæmia were noted from the beginning and were continuously studied since 1936. At first the total blood-fat was estimated by the lipocrit, but from October, 1938, Dr. C. H. Gray carried out many complete analyses of the total and individual blood lipids (two are included in table II). In brief, these showed a general and parallel rise and fall in all the lipoid constituents of the blood and a normal free/ester cholesterol ratio. The highest lipæmia, recorded on July 1, 1940, was 8·175 g. per 100 ml., the lowest 0·985 g. per 100 ml., on Feb. 13, 1940, with simultaneous cholesterol figures of 687 mg. and 125 mg. per 100 ml. respectively. It became clear from his studies that the appearance of the plasma and an estimation of cholesterol gave an accurate enough index of the degree of lipæmia without complete chemical analysis (impossible for a period when his laboratory was bombed). Slight lactescence of the plasma was noted when the total lipids were 1·5–2%, obvious milkiness when 2–3·5%, and a heavy cream settling out at higher figures. Lipæmia retinalis was infrequently present, being slight at first and recurring for a few days in April, 1940, with 5·5% lipæmia. The critical retinal level appeared to be about 5%.

The widespread papular xanthomatosis already described rapidly disappeared after treatment and never recurred in an overt form. At times, when high grades of lipæmia persisted for a week or two, a few papules developed in the upper arms, but so small as to be more easily felt than seen. Temporary changes in the size of the liver and spleen in relation to the lipæmia were difficult to be certain about. The gradually enlarging spleen certainly showed no appreciable change in size or consistence with varying lipæmia, and the liver no clear recession during times when the lipæmia was kept low for weeks on end.

It was not until February, 1941, when the diabetes had been controlled for three months by enormous but varying doses of insulin, 1000–2000 units a day, that it was fully realised that the lipæmia depended essentially on the degree of diabetic control. The amount of carbohydrate metabolised, whether 120 g. or 300 g., made no difference, and there was no lipæmia when the blood-sugar concentration was normal, and hyperglycæmia invariably produced lipæmia. It was proved too that there was no fixed dose of insulin which always prevented lipæmia, but a variable dose which at the time controlled the hyperglycæmia.

Relation of Lipæmia to Dietary Fat.—Before the above relation of lipæmia and hyperglycæmia was appreciated, the effects of different kinds and qualities of dietary fat were studied for long periods. For five months in 1938 the patient heroically followed a diet containing only some 10 g. of fat a day, in which skimmed milk, fatless fish, and a very occasional egg supplied all the protein. The lipæmia remained low for her at not more than 2% and the blood-cholesterol level about 200 mg. per 100 ml.

At other periods only vegetable fat (pure hydrogenated nut oil) was given on the assumption that it might be metabolised differently and because it is said to be lacking in the type of sterols which can elevate the blood-cholesterol level (Thannhauser 1940a). These different types and amounts of fat seemed to moderate the lipæmia; but, looking back, it is clear now that the reduced lipæmia coincided with periods of relatively good diabetic control and certainly depended on the blood-sugar level. There is no clear evidence that variations in either the fat-intake from as little as 10 g. to as much as 200 g. a day or the type of fat made any fundamental difference to the grade of lipæmia. I am sure they did not.

Both choline and lipocaic † were given separately and in full doses for six weeks, but neither showed any influence on the lipæmia or size of the liver and spleen.

In May, 1940, Prof. A. C. Frazer and Dr. H. C. Stewart kindly attempted to study the lipæmia by their method of lipomicron counts (Frazer and Stewart 1937, 1939) in this patient's serum. It was intended to study the effect of fat-meals, &c., by this method, which is much easier than chemical analyses; but the high-grade lipæmia made this technically impossible through clumping of fatty particles.

Absorption, Excretion, and Metabolism of Fat.—There has never been any clinical evidence of fatty diarrhœa or microscopical or chemical evidence of lack of absorption of fat from the gut. Fat-analyses of the dried fæces showed a normal percentage of total fat and a normal proportion of split to unsplit fat. Positive evidence too of fat-absorption was obtained in 1938, when the lipæmia rose from 2·2% to 5·2% three hours after a meal containing 70 g. of fat.

Studies of the respiratory quotient after fat-meals were undertaken to obtain evidence of ability to burn fat, but only indefinite and irregular results were obtained. This patient always showed a very variable respiratory quotient in the fasting condition (0·69–0·92), a finding which is common in severe diabetics on soluble insulin.

Protein Metabolism and Nitrogen Balance.—The protein in the diet was changed very little, and no studies were made on any special effect of protein on her condition. Up to July, 1940, her protein intake was 70 g. a day, after this 120 g., which continued for two years. This latter high amount was given partly to satisfy her large appetite and partly to help to fatten her, her only ambition.

The nitrogen balance was strongly negative in January, 1939, when with an intake of 10 g. she excreted 23, 19, and 16 g. on consecutive days. At this time her diet was low, her calorie intake only 1200 a day, whereas her expenditure (B.M.R. +58) was 2160 calories, and this probably explained the loss of nitrogen. Later, when on a very high calorie diet (December, 1940) with 1500 units of insulin a day and a well-controlled diabetes, the nitrogen balance was found to be positive by +2 g. a day.

High Metabolic Rate.—One of the most striking and puzzling features was the extremely high B.M.R. She *never showed any signs of Graves's disease*, and a high metabolic rate was not suspected and only discovered (+58) in December, 1938, during experiments on the respiratory quotient. It is unlikely that the metabolism was raised in 1936, because the pulse-rate was 70, the pulse pressure 40 mm. Hg (B.P. 110/70), and so the rise coincided with the full development of her syndrome. The B.M.R. has risen much higher, figures of over +150 being obtained on several occasions, and the clinical signs of this were clear: an enormous appetite, sweating particularly after meals, pulse-rate 90–100, pulse pressure 50–70 mm. Hg, and a temperature often above 99° F, but under 100° F. The thyroid gland seemed occasionally over-firm and slightly enlarged but was mainly normal to palpation; but there were no cardiac irregularities (although the conus arteriosus was dilated), no nervous or temperamental symptoms, and no eye symptoms or tremors.

At first the B.M.R. was estimated with the Benedict-Roth machine and calculated on Sanborn's figures. After the war necessitated its evacuation to our main country hospital, sometimes the patient went there for a special test, but more often the B.M.R. was done in London with a Douglas bag and Haldane apparatus. Although the patient was a perfect subject and the technique satisfactory, except when the Haldane apparatus suffered from blast on two occasions, wide variations were found in the estimations, such as +80% and +140% within two weeks of each other, for no obvious reason. Dr. J. D. Robertson, of the Middlesex Hospital, kindly checked our results, and, at a time when the patient was under iodine, obtained two figures of +81% and +83% on consecutive days, while our estimation showed +80% in the same week. I am satisfied that the irregularities observed are true estimations, but cannot explain them and merely point out that considerable unexplained variation occurred also in the diabetic condition of this mysterious patient. On the other hand, changes in the lipæmia and/or diabetic control had no observable effect on the B.M.R.

Iodine, however, had a clear though temporary effect in lowering the B.M.R. Ten minims of Lugol's iodine t.d.s. was given continuously for two months in August and September, 1940. Before administration the B.M.R. was +146 and +147; after two weeks' iodine +123 and +128; after seven weeks +81 and +80. After iodine was omitted, the B.M.R. rose again, but how soon I do not know, as the serious day and night bombing at this time interfered with such work. A month afterwards, however, the figure was +140. During this period of iodine the patient felt better and sweated less, the pulse-rate fell slightly, and the thyroid was perhaps softer and smaller. At her own request she resumed iodine later on

† I wish to thank Messrs. Boots Pure Drug Co. Ltd. and British Drug Houses Ltd. for preparing the lipocaic.

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and was on 10 min. t.d.s. continuously for many months before thyroidectomy, and the B.M.R. ran between +120% and +150%.

Thyroidectomy was undertaken in June, 1942, with no clear preconception of what would result. We were encouraged by the patient's adventurous attitude. She was tired of her condition and long stay in hospital and had seen dramatic improvement in thyrotoxic diabetics from the operation.

For some weeks before operation the patient had been on too little insulin, 160 units a day, had lost much weight, and from this and bronchiolitis was intensely lipæmic (cholesterol 770 mg. per ml.). This was corrected by 960 units a day (given four-hourly) and the patient brought to the theatre with a normal blood-sugar, no ketosis, and a reduced lipæmia, and still on 30 min. of iodine daily.

Mr. John Hunter removed the thyroid almost totally, and the recovery phase was fairly smooth. For a few days after operation the patient was somewhat sick and unable to eat even all her carbohydrate, and the insulin had to be reduced to 160 units a day, but quickly rose to 360 units again. During this phase an optimistic house-physician thought the liver smaller and softer, but I remained sceptical. As time went on, it became clear that thyroidectomy had made no difference to her general organic condition or to the diabetic or lipoid metabolism. The effect on her metabolic rate, however, was clear and interesting.

After operation the B.M.R. gradually fell until it reached +38% at the twelfth week. She gained 27 lb. and gradually developed a painful stiffness in all her muscles which became intolerable. The girth of the calf was increased (fig. 5), and the electrical reactions to a single galvanic stimulus showed a slower contraction and a more prolonged relaxation than normal muscles. There were no obvious subcutaneous or skin changes, and no noticeable changes in the hair, voice, or pulse-rate; but it seemed clear that she was developing symptoms of hypothyroidism, although the B.M.R. was so much above normal. The metabolism was raised to +65% by giving thyroid gr. 2 a day, and the pains were alleviated. But it required gr. 3 to make her feel quite well, and this restored her B.M.R. to +100%. She remained on this dose and at this metabolic level during the succeeding year. For the last six months of her life she felt in excellent health and had returned to full-time employment as a telephonist. She took 640 units of insulin a day, never had hypoglycæmia, and remained vigorous in spite of a constant lipæmia, considerable hyperglycæmia, a huge liver and spleen, and a complete absence of subcutaneous fat.

The following is the section report of the thyroid:

"Many nodular areas of hyperplasia throughout the gland, showing small and irregular acini lined by high columnar epithelium, often forming papillary projections. In such areas the smaller acini are mostly empty, and the larger ones show absorption of colloid. Foci of lymphocytic infiltration are associated with many of these areas, often showing the formation of lymphoid follicles. The acini of the intervening areas are large, well filled with colloid, and lined with flattened or cuboidal epithelium. The stroma is increased in amount and density, producing well-marked lobulation. *Frozen sections* do not show any abnormal intracellular deposits of fat. One or two lipoid-filled macrophage cells are present in a few of the acini, and the blood-vessels are rendered prominent in virtue of the high lipoid content of the plasma."

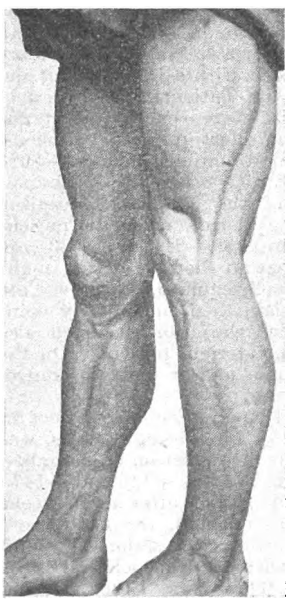

Fig. 5—Condition of legs in myxœdematous stage following thyroidectomy.

Although the histology shows a few areas of overactivity, such as are found in Graves's disease, it seems unlikely that this is the primary cause of her raised metabolism, and the sequence of events after thyroidectomy bears this out. Her usual high rate of metabolism, +100%, was reduced by operation, as one might expect, and she became "myxœdematous" at +40%, to return to her previous "normal" level when sufficient thyroid was given. It seems certain that her B.M.R. was not primarily due to thyrotoxicosis and was more akin to the increase found in leukæmia. I do not know whether the thyroid shows histological changes in leukæmia, or whether a raised B.M.R. per se can produce secondary reactive changes in the gland similar to those of thyrotoxicosis. I can find no published evidence on this point.

The highest B.M.R. figure obtained was +177%, and many readings have been over +140. These seem to constitute records, as the highest figures I can find mentioned are +129 in primary toxic goitre (Joll 1932) and +123 in leukæmia (Grafe 1923).

Calcium Balance.—A study of calcium balance was undertaken primarily at the suggestion of Dr. Robertson, to afford evidence on the presence of thyrotoxicosis, because Aub et al. (1929) have demonstrated that in Graves's disease, on a low intake of calcium, there is an increased total loss of calcium from the body, chiefly in the urine, and that the normal ratio of urinary : fæcal loss of calcium is reversed. Dr. C. H. Gray carried out the balance over a period of six days at a time when the patient's B.M.R. was +138%. On a daily intake of 140 mg. of calcium the average urinary output was 55 mg. (range 53–57 mg.), the fæcal loss 370 mg. per day (range 1450–780 in three-day periods), showing a negative balance of 280 mg. a day and a urinary : fæcal calcium ratio against thyrotoxicosis.

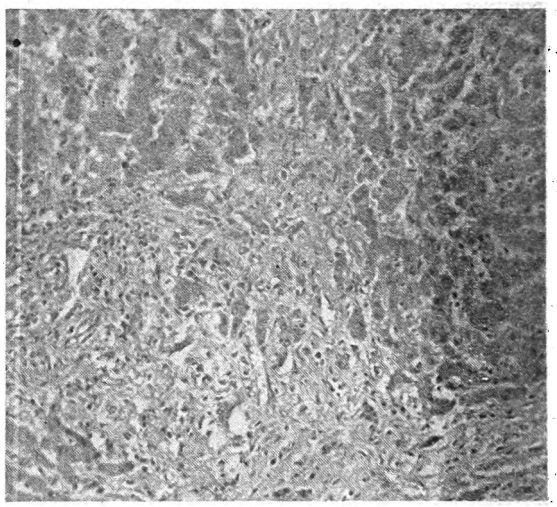

Fig. 6—Section of liver, showing portal cirrhosis. (×150.)

TERMINAL ILLNESS

In August, 1943, though still in vigorous health and full employment, the patient complained that her abdomen was uncomfortably fuller. The liver and spleen seemed the same, but a new cystic swelling was felt near the bladder. This enlarged rather rapidly and by October was diagnosed as a large ovarian cyst.

Our doubts about operation were finally decided by intolerable abdominal distension, and in December two large bilateral ovarian cysts and the appendix were removed by Mr. John Peel at laparotomy. The cysts were simple serous cysts lined with low columnar epithelium, with a few shallow invaginations into surrounding dense fibrous stroma. (At operation biopsy material from liver, spleen, pancreas, and muscle was obtained in a normo-lipæmic phase and is described below.) After operation great difficulties arose from pain, and vomiting was frequent, but her usual carbohydrate was administered, often intravenously. The insulin requirements fell greatly, and on some days as little as 80 units kept the urine completely sugar-free. The abdominal tension stitches would not hold, the wound gaped twice and became infected, and serious hæmorrhage occurred. The urine too became heavily infected with *Bact. coli* and enterococci, and in spite of blood, saline, and glucose transfusion she died suddenly three weeks later, after a few days' pyrexia

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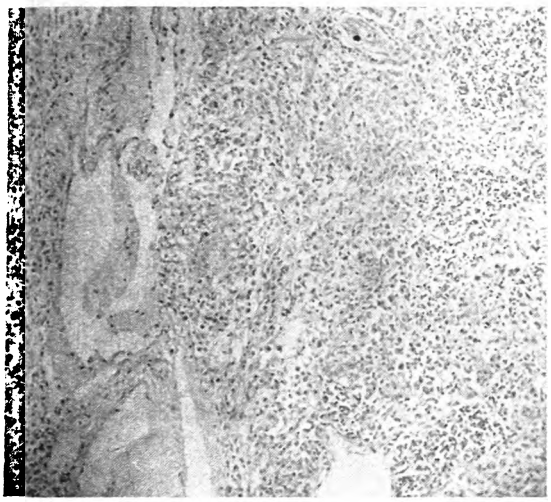

Fig. 7—Section of lymph-gland. (×75.)

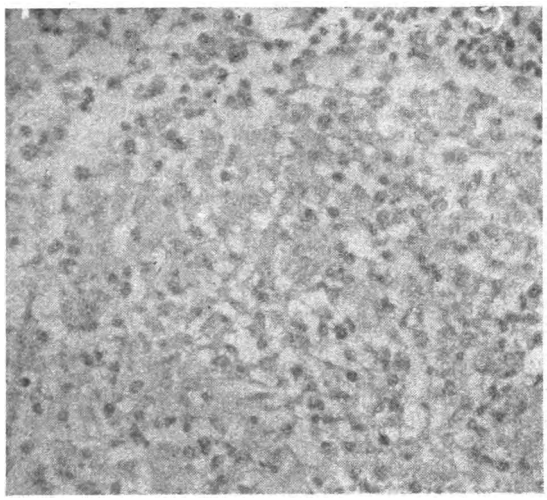

Fig. 8—Section of lymph-gland. (×300.)

of 103° F with rigors. Only 40 units of insulin was given at 8 A.M. that morning, after which she had taken glucose drinks well. The blood-sugar at noon was only 53 mg. per 100 ml. This may have contributed to her death at 5 P.M., but 60 g. of glucose was given intravenously at 2 P.M. without any recovery from increasing unconsciousness. I have seen a similar reduction of insulin requirements in other diabetics at the ebb of life.

AUTOPSY AND BIOPSY FINDINGS

Both living and postmortem specimens were obtained in a state of minimal lipæmia. The tissues for glycogen analyses were obtained an hour after death, and the autopsy was performed seventeen hours later, with intervening refrigeration.

General condition: there was a complete absence of subcutaneous, intra-abdominal, and perinephric fat. Unfortunately I stupidly omitted to have the marrow examined for fat. A generalised hard enlargement of *lymph-glands* was present everywhere, including the groins and neck. Large masses of these glands were found in the mediastinum, para-aortic areas, and mesentery, and on both surfaces of the diaphragm, and very large masses pressed on the head and half the tail of the pancreas. They were homogeneous and pinkish on section. The blood was not obviously lipæmic. There was no free fluid in the serous cavities, no peritonitis, and very little inflammatory reaction round the abdominal wound. The abdomen was three-quarters filled by the huge liver and big spleen.

The *liver* was enormously and uniformly enlarged and weighed 5057 g. (normal for her weight, 1650 g.‡). It was fibrotic, brownish, and did not look fatty. Microscopy § showed a well-marked portal cirrhosis (fig. 6), with considerable deposition of fibrous tissue along the portal tracts and infiltration with inflammatory cells, chiefly lymphocytes with a few mononuclears. There was proliferation of bile canaliculi. The polygonal cells of the liver appeared normal, and the liver cells contained no obvious excess of fat. Kupffer's cells showed no abnormality.

The biopsy material showed similar appearances, except that the liver cells contained more fat. Alcohol-fixed material (Best's carmine stain) proved the cells to be richly filled with glycogen.

The *spleen* was also enormously enlarged and weighed 1207 g. (normal 175 g.). It was slightly tough and showed perisplenitis over the lower pole. The sections showed little abnormality. There was no proliferation of the malpighian corpuscles. The sinuses were clearly seen and were filled with blood. No "foamy" or lipoid-containing cells were present. The piece removed during life showed similar appearances; except that the outlines of the sinuses were less clear, and they contained much less blood.

The *pancreas* was normal, apart from partial compression by masses of enlarged lymph-glands. Ordinary sections showed nothing abnormal, but special staining for granules was not undertaken. The piece removed at biopsy proved to be part of an enlarged gland.

The *kidneys* were enlarged and weighed 653 g. (normal 290 g.). They were normal in appearance and consistence, and the only abnormality found on section was an occasional partially or completely hyalinised glomerulus. There was no perinephric fat.

The *heart* was generally enlarged and weighed 341 g. (normal 260 g.). The muscle was good and normal microscopically. The mitral valve showed slight sclerotic thickening, but the coronary arteries were healthy, and aortic atheroma was minimal.

The *endocrine* glands were normal macro- and microscopically. Only remnants of the thyroid were present; the pituitary was normal, and the suprarenal showed only some interstitial infiltration, with vacuolated eosinophil material.

All other organs were normal, and the *enlarged lymph-glands* alone are of special interest in their unique appearance.

Para-aortic gland: the lymph sinuses both at the periphery of the gland and in its substance are widely dilated and filled with faintly eosinophil hyaline material containing vacuoles, which in places are so numerous as to give the eosinophil material a reticulated appearance. This material probably represents lymph in which were many fatty globules of various sizes. Besides this distension of sinuses, the whole gland appears œdematous. Distributed in the gland and particularly in the subcortical zone are rounded or irregular collections of lymphocytes about the size of normal lymph follicles, though devoid for the most part of any central collection of reticulum cells. The remainder of the gland is largely occupied by cells of irregular outline, with vesicular nuclei and bulky vacuolated cytoplasm (figs. 7 and 8). These probably represent the pulp reticulum cells, with many fat globules in their cytoplasm. The lack of frozen sections makes it impossible to be certain of the nature of the vacuoles in either of these situations.

The *œsophageal glands* and the *gland from the head of the pancreas* show similar changes, but the area occupied by the collections of normal lymphocytes is larger. The biopsy material of the *mesenteric glands* shows similar distension of the lymph sinuses, both peripheral and central, with vacuolated eosinophil material. The distension of sinuses within the gland is very variable but in some parts extreme. The cells with bulky vacuolated cytoplasm in the pulp are less conspicuous and numerous than in the postmortem material. Another gland from the neighbourhood of the pancreas shows little distension of sinuses but much overgrowth of the reticulum type of cell in some parts of the pulp. In none of the lymph-nodes is there any obvious proliferation of lipid-containing histiocytes.

Glycogen Analyses of Postmortem Material.—Samples for glycogen analysis were collected an hour after death. I can find practically no similar analyses but give for comparison figures obtained by Manton and Lowman (1943) from a normal infant, aged 14 months, eight hours after death, and some from a case of glycogenosis as a contrast (table I).

‡ The normal weights of organs are the averages given in Vierordt's tables (1906) for her sex, age, and weight.

§ I am greatly indebted to Dr. E. F. Creed, our pathologist, for the microscopical reports.

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It seems probable that the patient's tissue glycogen was normal. At least we know that biopsy material showed an abundance in her liver, and this was not fixed but disappeared rapidly and normally after death.

Published fat-analyses of the internal organs are too rare to establish any valid normal standard, but the figures given in table II seem to be at the upper limit of normality. At any rate it is clear that the internal organs were nearly normal in their fat-content in contrast to the excess in the blood and the deficiency of stored fat. Fat analysis of the brain gave the following figures:

Cholesterol	=	2·5 g. per 100 g. fresh material
Phospholipid	=	4·5 ,, ,, ,, ,,
Cholesterol/phospholipid	=	1·8 ,, ,, ,, ,,
Free cholesterol / Total cholesterol × 100	=	90

Comparable Syndromes and Cases

It is a sound principle to assume that a diseased condition like the above, however diverse its manifestations, is due to one primary pathological process unless the contrary is clearly proved. This case does not fit into any recognised pattern of physiological disturbance or pathological syndrome, but there are comparable syndromes and one or two almost identical cases. It is, however, far easier to say what this case is not than what it is.

TABLE I—COMPARISON OF GLYCOGEN ANALYSES

Tissue	Glycogen (mg. per 100 ml.)		
	Present case	Manton and Lowman (1943)	Glycogen disease
Liver	84	100	14,000
Heart	40	70	2500
Kidney	64	60	100
Striped muscle ..	286	..	..

Diabetes with Lipæmia and Secondary Xanthomatosis.—The occurrence of lipæmia, hypercholesterolæmia, and xanthomatosis has been occasionally observed in diabetes, particularly before the use of insulin, and I have myself treated 4 cases in which blood and retinal lipæmia and skin eruptions have been quite as well marked as in the present case. All these cases, and many described by others, had severe associated ketosis, and these abnormal aspects of fat metabolism rapidly disappeared on treatment with adequate carbohydrate and insulin. It is now accepted that such a condition is brought about by the excessive mobilisation and utilisation of fat to compensate for the poor utilisation of carbohydrate in severe diabetes. The lipæmia usually disappears in a few days, the cholesterolæmia in a few weeks, and the skin lesions in 2–3 months, and do not reappear whatever the diet—even if hyperglycæmia is permitted—so long as adequate carbohydrate and insulin are given to abolish ketosis. The liver under such conditions may be somewhat enlarged at first and in my experience the spleen also. Similar temporary disturbances are occasionally seen in diabetic children poorly controlled for long periods; but the lipæmia is never gross, and xanthomatous manifestations are absent.

Hypercholesterolæmic Splenomegaly in Diabetes.—If the above-mentioned condition is not reversed by treatment and goes on long enough—and before the introduction of insulin it went on to death in coma—the spleen may become enlarged and then contains from the accumulation of cholesterol esters or some closely akin lipoid in the reticulo-endothelial cells, the so-called "foam-cells," very like the cells found in the Gaucher and Niemann-Pick types of splenomegaly. Such splenic enlargement was first described by Coats (1889), and similar cases have been recorded by Schultze (1912) and Oppenheimer and Fishberg (1925). In some but not all cases the liver also is enlarged. The present patient clearly does not fall into this category, for her spleen contained no foam-cells, and ketosis was strikingly absent.

Lipæmia and Xanthomatosis in Chronic Pancreatitis and Liver Disease.—Several rare and little-understood cases may be grouped together under this heading. Thannhauser (1940b) describes the rare condition of *xanthomatous biliary cirrhosis* characterised by cholesterol deposits in the biliary tracts. He also describes a group where lipæmia is associated with chronic pancreatitis, with characteristic intermittent attacks of abdominal pain and fever. From such cases the interesting suggestion has been made that the pancreas has, besides its antidiabetic function, an internal secretion with an antilipæmic action concerned with fat-metabolism. Eusterman and Montgomery (1944) discuss an interesting series of lipæmic cases with jaundice which are difficult to classify. None of these has any clear connexion with the condition I have described.

LIPODYSTROPHIES WITH METABOLIC DISTURBANCES

There is no satisfactory classification of the lipodystrophies or clear knowledge of their underlying ætiological factors. Various rather confused theories of local, general metabolic, endocrine, and autonomic nervous system disturbances have been advanced to explain lipodystrophy, and the evidence for various views is discussed by Harris and Reiser (1940). The lipodystrophies are rare, and complete lipo-atrophy extremely so. The commonest type is partial, in the upper part of the body, and is accompanied by such lipo-hypertrophy in the lower parts that the total deposition of fat is not reduced, and the condition is unlikely to affect lipoid or general metabolism. Some cases, however, are recorded with disturbances of carbohydrate, fat, or basal metabolism.

Cohen and Eis (1934) describe two women of menopausa age, one with +44 B.M.R. unaffected by thyroidectomy, and another with +70 B.M.R. (operation refused) who had cholesterolæmia and a raised blood-sugar. The case reported by Decourt et al. (1936) showed blood-fat 1·25%, total cholesterol 330 mg. per 100 ml., and B.M.R. +20, but no sugar disturbance.

Hansen and McQuarrie (1940) have published the clinical and pathological details of an extraordinary case of a boy (fig. 9) very similar to the present case.

At the age of 4 years this boy was admitted to hospital with complete lipodystrophy and a moderately enlarged liver, having become thin after an attack of jaundice at the age of 3 years. No endocrine or blood abnormalities except a slightly diabetic glucose-tolerance test were present at first. Next year he developed frank diabetes, which persisted until his death at 9 years. He grew well but never regained fat. Like the present case he was insulin-resistant, requiring up to 280 units a day, and he also never showed ketosis. Ultimately he died, with progressive cirrhosis and a very large liver and spleen, from associated gastric hæmorrhage. In the terminal stages the level of neutral fat in the blood, at one time reported as above normal at 1500 mg. per 100 ml., fell to the very low figure of 51 mg. per 100 ml. At

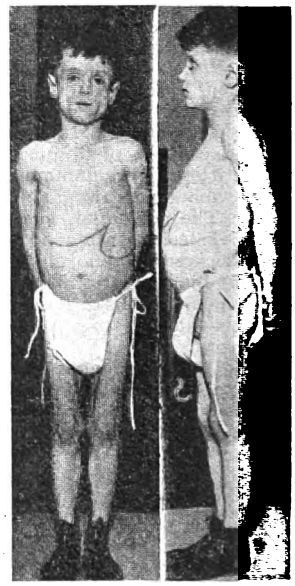

Fig. 9—Hansen and McQuarrie's (1940) case of lipohistiodiaresis (from Irvine McQuarrie's "The Experiments of Nature and Other Essays," Kansas, 1944).

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TABLE II—FAT-ANALYSES OF PLASMA (g. per 100 ml.) AND OTHER TISSUES (g. per 100 g. of fresh material)

—	Plasma		Liver	Spleen	Kidney
	Min.	Max.			
Total lipids	0·985	8·175	3·290	2·10	2·32
Glyceride	0·504	6·430	2·270	0·902	1·113
Phospholipid	0·200	0·799	0·658	0·650	0·512
Free cholesterol	0·048	0·344	0·230	0·231	0·372
Total cholesterol	0·125	0·687	0·302	0·412	0·555
$\frac{\text{Free cholesterol}}{\text{Total cholesterol}} \times 100$	38	50	76	56	67

autopsy no significant pathological changes were found except portal cirrhosis, but neutral fat was completely absent from the skin and the perinephric tissues and scanty in the liver, whereas the cholesterol and phospholipids were normal. Hansen and McQuarrie suggest the word "lipohistiodiaresis" (lack of fat in the tissues) as a descriptive term, suggest that there was a highly selective disturbance in the lipid-regulating function of the liver, and consider that the curious diabetes offers some evidence in favour of abnormal conversion of fat into carbohydrate. Here is a "diabetes" very like that of the present case.

Another case of lipodystrophy described by Ziegler (1928) shows metabolic disturbances *almost identical* with those found in my case, and the full details published merit close study but must be abbreviated here. A woman, aged 27, never robust, was admitted in 1925 to the Mayo Clinic with swellings over the body for two years and well-marked general weakness for three years. At 11 years of age tender swellings appeared on the legs and thighs for two to three weeks, and these were followed by complete loss of all subcutaneous fat in the lower extremities. After marriage at 22 she soon became pregnant, and three months after delivery her face became swollen and hard, and erysipelas was feared. These swellings disappeared in another three months and with them all the subcutaneous fat in the upper part of the body. After this she noted swellings of the glands for a time, and large brown itching areas appeared all over the skin. She began to have epigastric soreness, and the liver and spleen were enlarged and became huge within a few weeks. Thirst and polyuria developed at this time, and heavy glycosuria was discovered.

Investigation in the Mayo Clinic showed the following picture and no other important abnormalities. Complete lipodystrophy was confirmed, and the brown pigmented skin areas were labelled tinea versicolor. Both liver and spleen reached to the umbilicus and were soft, compressible, and not tender. The urine contained "+2" albumin, 4·6% sugar, but no ketones, and the sugar was easily controlled by restriction of diet without insulin. The blood-sugar was 130 mg. per 100 ml., but whether before or after treatment is not stated. The B.M.R., estimated six times, varied between +40% and +57%, but the thyroid gland was not enlarged. Iodine had no influence on the metabolic rate, which, after subtotal thyroidectomy, remained at +50 to +59%. The pathologist's report was "colloid and fœtal thyroid with extensive interacinar hyalinisation." From all this it is certain that thyrotoxicosis was absent. Slight enlargement of all palpable lymph-nodes is recorded and one excised gland was labelled briefly as "inflammatory." She was discharged in much the same condition. I wrote to Dr. Russell Wilder in 1940 for further details, and his kind reply stated that all they knew was that she gave birth to a living child in 1930 and died in 1936. Xanthomatosis was not present, nor any gross lipæmia, which would not have been missed in repeated blood-tests.

Apart from visible lipæmia, therefore, Ziegler's case is identical with the present case, and, because I wish to show that the condition I have described is not an isolated freak but has a tangible metabolic lesson, I venture to argue how Ziegler's lipodystrophic case might have a similar disturbance of fat-metabolism without an obvious lipæmia.

The sudden enormous enlargement of liver and spleen with simultaneous heavy glycosuria was almost certainly due to engorgement with fat, and this may have removed any obvious accumulation of fat in the blood. Such a happening is supported by a report by Holt et al. (1939) of a child with "familial idiopathic lipæmia" in whom recurrent attacks of acute enlargement of the liver and spleen repeatedly coincided with a fall of lipæmia from 8% to 2%. Again, in Ziegler's case lipodystrophy was based on a subcutaneous inflammatory process, and there is no reason to think that the retroperitoneal fat depots would disappear and could probably still store excess of circulating fat. Further, although the diabetes seemed severe when the rapid swelling of the liver took place, it was easily controlled by diet, and a condition of carbohydrate metabolism (blood-sugar 130 mg. per 100 ml.) was quickly reached at which even the present case would have shown no lipæmia. For these reasons I think it fair to suggest that the two cases are fundamentally identical.‖

(To be concluded)

AMINOTHIAZOLE IN THE TREATMENT OF THYROTOXICOSIS

MARCEL PERRAULT DANIEL BOVET

EXPERIMENTAL and clinical results obtained when aminothiazole (2921 R.P., 'Abadol') was used to neutralise thyroid function and to remedy thyrotoxicosis have been described by Perrault, Bovet, and Droguet (1944a and b), Perrault, Bovet, and Jeantet (1944), Perrault and Bovet (1945), and Bovet et al. (1946).

From our clinical experience of this drug in 129 cases we conclude that it is highly efficacious and well tolerated. It seems to us, therefore, that aminothiazole is superior to other substances previously recommended, such as thiourea and thiouracil, which have an undoubted therapeutic value but are not well tolerated (Astwood 1943a, 1944, Rawson et al. 1944, McGavack et al. 1944).

We decided to study the active properties of aminothiazole (Astwood 1943b) in view of the observations made in human beings by Dr. Jeantet of Lyons. In the summer of 1943 ¶ his attention was drawn to unusual goitres in workmen employed in the extraction of aminothiazole, which is used in industry in large quantities for the preparation of sulphathiazole. Not one of the men so affected complained of functional or general disorders. They showed no signs of thyrotoxicosis, and their basal metabolism was reduced. One employee who previously had a mild thyrotoxicosis found that his symptoms disappeared and his general condition improved after he had worked for two months at this process. From this chance observation emerged several facts which seemed to indicate that aminothiazole could lead to the formation of a goitre while reducing thyroid activity, and that it was relatively harmless.

Control experiments in animals and clinical trials in patients with thyrotoxicosis were next instituted. Our work had made considerable progress, and we had already published the results of our first clinical observations, when Astwood's (1943b) report on 106 different chemical preparations became obtainable, in which he first made known the antithyroid action of aminothiazole in the rat. On the whole our experiments, which are described below, have confirmed and supplemented his findings.

‖ Dr. Posner, of Czechoslovakia, has just written to say he has an identical case in a boy of six.

¶ At that time we were unfortunately unable to peruse the Anglo-American writings in this field.

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Up to January, 1946, the number of cases treated totalled 129, as follows**:

Thyrotoxicosis	71	Angina pectoris ..	8
Vagosympathetic imbalance	16	Pulmonary tuberculosis	9
Hypertension	10	Normal subjects ..	15

HISTOLOGICAL FINDINGS IN RATS

Effects of a Single Injection of Half the Lethal Dose.—After 48 hours the gland was congested and showed localised œdema and hæmorrhages. The colloid in the vesicles was either absent or scanty, vacuolated, and altered in its staining reactions. Much of the cubical epithelium had desquamated, and many nuclei showed pyknotic changes. Briefly, the lesions were those of congestion and inflammation, with diminution of the colloid. From the fifth to the fifteenth day very tall columnar epithelium took the place of the desquamated cubical epithelium, with the result that the picture resembled that of a salivary gland. The colloid was still scanty or absent. From the eighteenth day onwards the thyroid structure regained its normal appearance, but some areas continued to resemble salivary-gland tissue, and some were still necrotic. By the thirtieth day the thyroid was almost normal.

The weights of the glands examined tallied well with the histological changes. To begin with there was an increase of weight corresponding to the stage of œdema and congestion. From the fifth to the ninth day there was a reduction in weight indicating the stage of necrosis. From the ninth to the fifteenth day the weight slowly increased, this being in step with the renewal of the epithelium, and from the eighteenth to the thirtieth day there was a considerable rise in weight in accordance with the renewal of the epithelium and the reappearance of the colloid. The average weights of thyroid glands observed were as follows:

	Weight (mg.)		*Weight (mg.)*
Controls	11·0	After 15 days ..	18·5
After 2 days ..	18·0	„ 18 „ ..	24·5
„ 6 „ ..	14·5	„ 30 „ ..	31·0
„ 9 „ ..	10·0		

Effects of Repeated Injections.—Repeated subtoxic doses (0·25 g. per kg.) given for ten days produced a morphological effect identical with, but more pronounced than, that seen after a single injection. The continued administration of the drug did not hinder the renewal of the epithelium. After ten injections given on consecutive days the degenerative changes were confined to certain areas only, most of the gland acquiring a resemblance to salivary-gland tissue as already described.

Repeated doses smaller than the subtoxic dose produced various effects according to the size of the dose and the length of its administration. After 0·2 g. per kg. had been given for 5–8 days, a few vesicles with normal colloid could still be seen at the periphery of the gland; all the other vesicles had disappeared. After a dose of 0·1 or 0·05 g. per kg. given for the same period, the colloid, though still plentiful, had diminished in amount, and its staining properties had altered. Here and there, particularly in the middle of the gland, were limited areas of necrosis and patches of glandular disintegration.

If treatment is continued beyond eight days it does not appear to have much effect on the morphology of the gland. In animals treated for twenty-five days, and even for ninety days, the structure of the vesicles persists, colloid is absent, and the epithelium is columnar.

If the drug, instead of being given in a single daily dose, is given more or less continuously, dissolved in the drinking-water, the effective dose is much smaller. If the rat drinks a solution of 0·01%–0·02%, which corresponds to a daily absorption of 10–20 mg. per kg., one may note a great change in the colloid, and it may even disappear completely.

After thirty days' treatment the glands of two rats exhibited throughout a "salivary" appearance, with absence of the colloid. In 3 animals of the same group the structure of the thyroid had returned almost entirely to normal six days after treatment ceased.

Examination of the viscera of rats receiving protracted treatment did not show any appreciable changes, except a slight infiltration of the liver and a mild interstitial reaction in the kidneys. The testes, ovaries, pancreas, and suprarenals were normal. The parathyroid glands occasionally showed sclerosis, which did not seem to be related to changes in the thyroid. The pituitary gland was slightly congested.

It thus appears at first sight that aminothiazole is a toxic substance with a remarkably selective action on the thyroid gland. The lesions produced healed quickly under the experimental conditions.

PHARMACOLOGY AND MODE OF ACTION

In rats and mice injected with large doses the basal metabolism is gradually reduced, in most cases by about 20%.

Aminothiazole has little effect on the metamorphosis of batrachians.

The toxicity of aminothiazole is relatively low. Half the lethal dose in the mouse is 0·25 g. per kg., given subcutaneously for six days. Poisoning may be cumulative and cause late death after various periods. The animals show a characteristic œdema of the face, with swollen cheeks and the eyes barely visible.

Aminothiazole has no effect on the blood-pressure; nor does it exert any action on the tone of smooth muscle, on respiration, or on the excitability of the autonomic nervous system. It is mildly antiseptic, being bacteriostatic in a strength of 1 : 100 and bactericidal in a strength of 1 : 20 when tested with *Staph. aureus*. It is rapidly destroyed in the body. It can be estimated in the body fluids by a method of diazotisation and linkage similar to that used with the sulphonamides.

The action of aminothiazole is very similar to that of the other antithyroid substances. This is made clear by the investigations of Joliot-Curie et al. (1945), who, using radio-active iodine, have shown that aminothiazole hinders the synthesis of di-iodotyrosine and thyroxine. Their findings agreed with those of Kennedy (1942), Richter and Clisby (1941), Mackenzie et al. (1941), and Astwood et al. (1943) and the hypothesis suggested by Harington (1944). Twenty-four hours after the injection of ionised iodine the search for newly formed di-iodotyrosine and thyroxine showed that premedication with aminothiazole, though it had no effect on the penetration of iodine into the thyroid, did in fact prevent the normal synthesis of thyroid hormone.

The reactionary hyperplasia is almost certainly due, as Griesbach et al. (1941) and Mackenzie et al. (1941) suggested, to some result of pituitary reaction to the shortage of thyroxine. The analogy between the successive histological changes seen after poisoning with aminothiazole and those seen when thyroid activity is stimulated by the injection of a thyrotropic pituitary hormone is fairly evident when serial sections are examined.

CLINICAL RESULTS IN THYROTOXICOSIS

Dosage.—The drug was given exclusively by mouth in either cachets or tablets each containing 0·01 g. of aminothiazole. The effective dose seems to be about 0·4 g. When treatment is first started we often give 0·6 or even 0·8 g. When improvement has occurred we like to make quite sure of a satisfactory result and continue treatment with maintenance doses of 0·3 or 0·2 g., or even less. This dosage is divided into 3–6 portions. It is convenient to give three doses

** The total includes personal cases and those of our colleagues Drs. Boudreaux, Bourdin, de Brux, Célice, Droguet, Léger, Pellerat, and Sigwald.

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during the day, one with each of the principal meals. It is best to give it in the middle or at the end of the meal.

At first we gave interrupted treatment at various intervals, but we now consider that it is better to give a longer uninterrupted course, which should last long enough to keep the patient for some weeks or months at a weight which is normal for height, age, sex, and build; to keep the pulse-rate somewhat below the average—i.e., 64–70—and to keep the metabolic rate normal or even a little below normal—i.e., between −1% and −5%. Experience has further shown that it is sufficient in practice to check the weight weekly and the pulse-rate daily. Thus the duration of treatment varies considerably according to the severity of the condition, the length of history of thyrotoxicosis, and the response to treatment.

The length of treatment varied from three weeks (which we now consider too little) to six months. One of our patients, who has been completely cured of his thyrotoxicosis, except for the slowly regressive exophthalmos and slight goitre, is now in the eighth month of treatment with aminothiazole, but is receiving the very small daily dose of 0·1 g., which is sufficient to keep him in balance.

Complications and Undesirable Effects.—On the whole the drug is well tolerated. In the whole series of 129 subjects, we encountered complications†† in 15 (11·6%); in 8 cases these were transitory and in the other 7 they were severe enough to necessitate the cessation of treatment. The details were as follows:

Drug fever	7	Digestive intolerance (1 with fever)	2
Erythema (2 with fever)	3	Lumbar pain and oliguria	2
Urticaria	1		

In the cases of thyrotoxicosis we saw one case of erythema after nine days' treatment in a patient with a generally raised sensitivity; one case of general reaction with fever, vomiting, and a transient nodular eruption in a patient whom we were able to continue to treat by giving nicotinic acid at the same time in doses of 0·05 g. for each 0·1 g. of aminothiazole; one case of transient fever; and one slight case of gastric intolerance, which also yielded to nicotinic acid.

We have not observed any cyanosis, headache, jaundice, albuminuria, or blood changes—i.e., those signs of intolerance which may either be merely uncomfortable or may end dramatically, such as agranulocytosis, which, as noted by Himsworth (1944), and Berk and Sapeika (1944) for thiourea and by McGavack et al. (1944), Rawson et al. (1944), and Astwood (1944) for thiouracil, are a great hindrance to successful treatment with certain antithyroid drugs.

In France we have no opinion on the value of thiouracil other than that gained from a study of the literature in English. But, in contrast with this, considerable use has been made of thiourea by Albahary (1944), Laroche (1944), and ourselves (1945) among others. Our impressions are in line with those gained by Anglo-American clinicians: thiourea is certainly effective but not well tolerated.

Systematic studies of normal persons who have had lengthy courses of aminothiazole showed no evidence of any significant change in renal and hepatic function or in the body fluids, blood, or tissues.

Two properties of aminothiazole must be emphasised: (1) It is a reducing substance; hence its presence will falsify the tests for glucose by the usual methods. (2) It will impart a colour to the body fluids, serum, and urine; this may be anything from orange-yellow to bright red. The latter colour is often seen and has often been a nuisance, as it interferes with the Bengal-red test. Its presence has no real significance either for prognosis or for the continuation of treatment. It appears to be due to breakdown products of the drug.

As a measure of prudence we gave aminothiazole alone at the beginning of our clinical trials. Now we like to give it with nicotinic acid, which, as shown above, increases gastric tolerance to the drug and perhaps general tolerance also, as it does for the sulphonamides. If it proved necessary to give other drugs concurrently, we have done so without noting any disadvantages from this practice, and so far we have not found any incompatibility.

Activity.—This has always been satisfactory and often striking. Naturally, the rapidity of action and its efficacy have varied from case to case, but the action has always been produced and is far and away superior to that of other drugs. Moreover, most of the patients treated were persons who had not benefited from iodine therapy. Except a few very bad cases of heart-failure, all those treated were kept up and about; we did not give any of the usual adjuvant remedies.

Subjectively the effect is felt very quickly. Within a few days, usually between three and seven, the patient feels relieved of most of his functional disturbances. He feels more calm and less irritable, sleeps better, and is less or no longer affected by spasms of digestive and respiratory disturbance. He will of his own accord stop taking the adjuvant drugs, which he had hitherto been taking, such as 'Gardenal,' eserine, and bromides.

Objectively the results are no less striking, but the various signs of disease are not equally affected. Tachycardia and cardiovascular abnormalities are the quickest to respond and exophthalmos the slowest.

At first the *goitre* did not seem to be altered. But, since we instituted longer treatment or adapted the treatment better to the particular needs of each case, we can reasonably hope for regression of the goitre. Among the first changes were the rapid disappearance of the vascular throbbing and humming so typical of the goitre in thyrotoxicosis. Then, after the gland had sometimes swollen for a little while, one noted a slow but sure shrinkage. The consistence of the swelling was peculiar and quite different from that noted in thyrotoxicosis or in simple goitres. The thyroid was firm but not hard, feeling somewhat like a tightly rolled ball of gauze. If the swelling, though diffuse, is greatest in one lobe, it is this lobe which shows the slowest diminution in size. The same applies to the nodules in a nodular goitre. The length of history of the goitre seems to be the most important factor affecting the rate of shrinkage. If it has been present only for a short time, one may expect a rapid and complete disappearance. But an old chronic goitre shrinks much more slowly, and the residual swelling may be somewhat disappointing æsthetically. Fortunately, however, most goitres in thyrotoxicosis are not very large. We see then that the goitre is one of the most persistent features of the disease. Nevertheless, one can and should improve it if treatment is carried out with sufficient perseverance.

Exophthalmos must, on the contrary, be regarded as almost entirely resistant to treatment. It is true that in mild cases, in which it has amounted to a mere brightness of the eye or a slight protrusion, it may disappear almost completely. But in the more advanced cases such improvement as takes place is far from adequate. This is always the most persistent sign, whatever form of treatment is used.

Tremors disappear entirely or are sufficiently reduced in 7–10 days to permit the patient to write again without difficulty or work at a trade which requires manual dexterity.

Tachycardia has always cleared in 5–15 days, with a return of the pulse-rate to about 72. The pulse also

†† We have not included in this group the common finding of a red coloration of the urine, which does not seem to be of any significance. We have heard of one case of toxic jaundice, and of one death from hyperthermia on the tenth day, in which the responsibility of the drug was not clearly established.

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becomes steady, and the patient is freed from the sensation of throbbing which many find so unpleasant. If the heart has shown signs of weakness, these soon disappear. If heart tonics have been given, their effects are at first augmented and made more certain; later they can either be stopped altogether or used in much reduced doses. Of all signs tachycardia was the one which responded most rapidly and most satisfactorily to treatment.

The *body-weight* increases, if sufficient nourishment is taken, by several kilogrammes. This increase in weight is not always immediate but may be delayed until treatment has continued for a month, even if there has been an obvious objective improvement and the basal metabolism has also improved considerably. It is better to try to get the weight up to the upper limit of normal for a given age, height, sex, and build.

The *basal metabolic rate* returns to normal within a few weeks. We think it better not to leave it at a figure of about +10%, usually considered to be sufficient, but to aim at a lower figure, from −1% to −5%, and to keep the patient at about that mark. It has been shown in practice that observation of the weight and of the pulse-rate is sufficient to regulate treatment.

The *blood cholesterol* rises to normal if it has been low at the start of treatment, but the figure and its variations with treatment have no absolute value in hyperthyroidism.

CONCLUSIONS

It is impossible today to think about thyrotoxicosis without considering the antithyroid drugs. Among the preparations found in this group aminothiazole has been found very effective, reliable, and easy to handle.

Without dispensing entirely with surgery, one may use antithyroidic products in preoperative treatment, even in very grave cases. It is largely equivalent to iodotherapy.

In most cases, however, the indications for the use of the drug do not stop here. It may be used alone to provide complete cure in recent or mild cases. In other patients it will bring about a balance equivalent to functional cure, treatment then being with smaller doses.

Aminothiazole is harmless enough to be given in cases in which, though thyrotoxicosis is not definitely diagnosed, it is possibly present.

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Dr. Ernest W. Goodpasture, professor of pathology at Vanderbilt University, Nashville, Tennessee, is to receive the annual award of $5000 from the Passano Foundation for his achievements in developing the method of propagating viruses by inoculation of chick embryos, and for contributions to knowledge of the cell-parasite relationship in bacterial and virus infection.

NUTRITIONAL NEUROPATHY

IN PRISONERS-OF-WAR AND INTERNEES FROM HONG-KONG

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THIS is a study of neurological symptoms in a group of about 200 sick internees and prisoners-of-war released from Hong-Kong in September, 1945, who were transferred to the Royal Naval Hospital, Sydney, Australia, for further treatment. They comprised officers and men from the three Services and Merchant Navy, and civilians of both sexes. They had all been taken prisoner at the fall of Hong-Kong in December, 1941, and, although kept in three main camps under varying conditions of discipline, had had basically the same diet. Some of them, however, had occasionally augmented their rations in various ways, such as smuggling through friendly Chinese, or the rare Red Cross parcel.

The accompanying table gives the weight and calorie value of the daily rations in one of the camps; the figures represent a maximum, the stated amounts often not being available.

WEIGHT AND CALORIE VALUE OF DAILY RATIONS AT ONE CAMP

—	Minimum required by League of Nations standard	1942	1943	1944	1945
Protein (g.) ..	75	52·0	45·1	37·5	33·2
Fat (g.)	50	31·3	20·2	22·7	24·8
Carbohydrate (g.)	400	337·5	298·4	300·6	343·0
Calories	2400	1753	1596	1566	1732
Vitamin A (I.U.)	5000	10,185	10,347	6910	4978
Vitamin B (I.U.)	250–500	163	132	100	90
Vitamin B (S.B.U.)	400–800	216	161	58	75
Vitamin C (mg.)	50–75	67	73	64	73
Calcium (g.) ..	0·800	0·265	0·250	0·317	0·264
Phosphorus (g.)	1·200	0·537	0·512	0·576	0·548
Iron (g.).. ..	0·012	0·015	0·003	0·012	0·009

The mainstay of the diet was ½–¾ lb. of rice a day, usually polished and often deteriorating from storage. After the first year meat and eggs became unobtainable, but small amounts of dried fish were available, the maximum being 2 oz. a day. Other inconstant additions were beans, peanut-oil, and green vegetables (often only chrysanthemum leaves). As far as can be ascertained, at no time did maize form a constituent part of their diet. On such rations ratings were expected to do hard manual labour, and officers and internees could volunteer for duties round the camp; internees who worked were given additional food.

NEUROLOGICAL SYNDROME

Under these conditions symptoms developed with remarkable constancy and in a similar chronological order. Thus within three months of imprisonment the presenting symptom of swelling of the ankles arose; this was followed by weakness and paræsthesia of the limbs, difficulty in walking, and failure of vision and hearing. Towards the end of 1942 and early in 1943 skin lesions suggesting pellagra were noted—stomatitis and dermatitis of the scrotum, the latter being extremely common. At this stage also a distressing symptom described as "electric" or "jumping" feet made its appearance; this was characterised by a burning sensation and extreme hyperæsthesia of the soles, which caused

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loss of sleep and made the sufferers immerse their feet in cold water for relief. The skin symptoms and to some extent the "electric" feet responded well to nicotinic acid, which became available in 1943; but the neuritic symptoms remained essentially stationary despite thiamine and nicotinic acid, and the end-result on release in the worst cases was defective vision, nerve deafness, gross ataxia, anæsthesia, and wasting of the limbs.

Most patients had diarrhœa at some time during their imprisonment, but chronic diarrhœa was not a constant feature in the history. On admission to R.N. Hospital, Sydney, there were no definite signs of frank vitamin-deficiency, such as the skin lesions of pellagra or ariboflavinosis, but all the patients had lost a considerable amount of weight.

Of the 200 mixed medical and surgical cases under review, 74 showed grossly abnormal neurological signs, which may be classified briefly as follows:

	Cases
Optic atrophy and ataxic paraplegia	31
Ataxic paraplegia only	21
Optic atrophy only	13
Optic atrophy, nerve deafness, and ataxic paraplegia	6
Optic atrophy and nerve deafness	3

ILLUSTRATIVE CASE-RECORDS

The following cases are selected as illustrating gradations and varieties of the severe syndrome.

CASE 1.—A man, aged 46, was taken prisoner on Christmas Day, 1941. In April, 1942, he noted œdema of the ankles, and in October, 1942, he had general weakness of the legs and vision started to fail, everything becoming hazy until January, 1943, when he could hardly see at all.

Early in 1943 he started to have "electric shocks" in the legs. Beginning in October, 1942, and continuing almost for three years he had nicotinic acid 20 mg. and thiamine 3 mg. nearly every day by injection, without any improvement in his symptoms. He lost about 90 lb. in weight in all.

On admission to R.N.H. he complained mainly of difficulty in vision and weakness of the legs. Examination of his eyes showed vision R and L 6/60; peripheral fields full; absolute central scotoma in both eyes; very slight bilateral temporal pallor. Both maculæ showed a few pin-point spots of exudate and very fine hazy-looking granules.

Examination of his central nervous system showed loss of sensation to light touch and pinprick, and of joint sensation over feet, legs, and thighs, extending to the level of the umbilicus; weakness of dorsiflexion of feet; ataxia of legs and rombergism; ankle-reflexes absent but other reflexes normal.

There had been no improvement in this case with parenteral vitamin therapy over three years.

CASE 2.—A man, aged 25, taken prisoner on Christmas Day, 1941, noted in June, 1942, that his vision was starting to fail; the failure became gradually worse and reached its maximum in December, 1943. In September, 1942, weakness of the legs and pain in the muscles developed. In December, 1943, deafness was noted, which has persisted.

At the end of 1943 he had six injections of thiamine and a few of nicotinic acid. In 1944 he was given nicotinic acid 2·36 g. in four months, and in 1945 thiamine and nicotinic acid daily for some weeks. During the whole time he was a prisoner-of-war he was liable to attacks of diarrhœa. He did not have malaria.

On admission to R.N.H. he complained mainly of difficulty in reading and walking. He thought his eyesight had improved a little since December, 1943, but he still had the greatest difficulty in reading. If he looked at a page, there were blank spaces in it, and he could not judge distances. Vision: R 6/36, L 6/60. There was only a trivial error of refraction; glasses were of no practical value. Fields showed a definite central relative scotoma in each eye. Fundi showed temporal pallor of both disks, vessels normal. Both maculæ were studded with dots of yellow exudate.

Examination of his central nervous system showed slight weakness of extension of wrists; ataxia, with high stepping gait due to bilateral foot-drop; hypersensitivity of soles, but, in general, anæsthesia of glove-and-stocking type; much wasting of legs, and paralysis of dorsiflexors of feet; knee-jerks present, but ankle-jerks absent.

A fractional test-meal showed low free acid. The Wassermann reaction was negative. Cerebrospinal fluid showed no abnormality.

This case shows the complete syndrome with gross defect in vision, deafness, and signs of peripheral neuritis.

CASE 3.—A man, aged 27, was taken prisoner on Christmas Day, 1941. In April, 1943, he noted failure of vision and deafness, and "electric feet" and foot-drop developed. Temporal pallor of the optic disks was observed. In September, 1943, tinnitus came on.

On admission to R.N.H. he complained mainly of total deafness, tinnitus, defective vision, and difficulty in walking. Vision: R 6/60, L 3/60; central scotomata present; slight temporal pallor of disks.

He could just hear a shout in either ear; both tympanic membranes were intact. He had bilateral foot-drop, with high stepping gait, ataxia, and rombergism. There was no vibration sense in the ankles. Knee- and ankle-reflexes were absent, and there was stocking anæsthesia to pinprick. A fractional test-meal showed much diminution of free acid.

This case showed involvement of 2nd and 8th cranial nerves in addition to peripheral neuritis.

CASE 4.—A man, aged 60, taken prisoner on Christmas Day, 1941, noted in April, 1942, that his legs were swollen. He received no treatment and continued to work. In September, 1942, when working long hours in the sun, he noted pins-and-needles all over his eyes. His vision failed rapidly, and he went almost blind in both eyes within two days. There has been no change since that time, and for three years he has not been able to read. In December, 1942, pellagra-like symptoms started: sore tongue, dermatitis of the scrotum, and "electric feet." This phase of his illness lasted about four months. Irregularly during 1943 he had thiamine and nicotinic acid by injection. In September, 1943, he had malaria.

On admission to R.N.H. he complained mainly of poor vision and of numbness in his legs. Examination of his eyes showed cornea, media, pupils, and ocular movements normal. Vision eccentrically was 6/6, 6/6, but the letters were partially obscured by "white patches." He could not see to read ordinary print, but the provision of a 2·5 D lens in each eye helped him to do so. Peripheral fields full. Small paracentral relative scotoma present in right eye close to the fixation point, and a much larger one in the left eye. Fundi showed vessels normal but both disks greyish and atrophic. Both maculæ showed numerous white patches of exudate. Examination of central nervous system showed reflexes, sensation, power, and gait normal.

Note the sudden onset of failure of vision.

CASE 5.—A man, aged 44, was taken prisoner on Christmas Day, 1941. In January, 1942, he developed dysentery, and he had chronic diarrhœa for the next seven months. In December, 1942, numbness of hands and feet and a prickling sensation in the soles developed. At the same time he had septic blisters on his body and a sore tongue. He was in the camp hospital from December, 1942, almost all the time until his release. During this period he received thiamine and nicotinic acid. In December, 1943, his sight began to fail gradually.

On admission to R.N.H. he complained that his hands and feet were numb, and that his legs jumped at night. He said that his vision was very bad, but thought it had improved slightly in the previous six months. Vision: R 3/60, L 3/60, not improved by correction of refraction error; absolute central scotoma of both eyes; bilateral temporal pallor and yellow dot-like exudate all over both maculæ.

Examination of his central nervous system showed Romberg's sign positive; incoördination of both lower limbs; absent reflexes in both upper and lower limbs; no foot-drop; sense of position normal; glove-and-stocking anæsthesia.

A histamine test-meal showed hyperchlorhydria. Wassermann reaction was negative. Cerebrospinal fluid was normal.

Note the onset of eye symptoms while he was on a steady intake of thiamine and nicotinic acid.

CASE 6.—A man, aged 24, who had been taken prisoner in the autumn of 1941 and had had no previous diseases, noted in April, 1942, failing vision, haze in front of eyes, photophobia, and headaches. In August, 1942, he had

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bacillary dysentery lasting five weeks. In December, 1943, he became deaf; legs were numb, and he had difficulty in walking; numbness extended to umbilicus; he lost his sense of balance; and knuckles of both hands became sore. He started to have thiamine and 'Apellagrin' by mouth and continued with this until release. In January, 1944, he had dysphonia, but no pain; some difficulty in swallowing; effort dyspnœa; hesitancy and frequency of micturition; sore mouth and tongue.

Examination in prison-camp hospital in February, 1944, showed: vision, R 6/60, L 4/60, and slight corneal dystrophy. Fundi showed slight temporal pallor. Pigmentation with stippling at the maculæ. Pupils normal. Corneal reflexes absent. Right facial weakness. Nerve deafness. Loss of sensation to pinprick up to nipple line. Sense of vibration and position lost in both legs. Hyperæsthesia of soles. Pronounced ataxia; unable to stand. Deep reflexes exaggerated in both upper and lower extremities. No clonus. Plantar response flexor.

In March, 1944, interosseous muscles of hands were noted to be wasted, and he had bilateral foot-drop. In July, 1944, he had incontinence of urine. In August, 1944, he had a sharp sensation of burning in his feet. In April, 1945, there was little change generally; aphonia still noted.

On admission to R.N.H. he complained of great difficulty in walking, numbness and burning of the feet, foot-drop, deafness, poor vision, urgency of micturition, and nocturnal enuresis.

Examination showed pallor of optic disks; central scotoma in both eyes; anæsthesia of right side of the face, and right facial paresis; bilateral nerve deafness; voice hoarse. There was much wasting of the intrinsic muscles of the hands, with weakness of the interossei, but no anæsthesia. In the legs there was loss of sense of vibration and position. Bilateral foot-drop, with spastic scissor gait and knee- and ankle-clonus. Generalised muscular wasting. Deep reflexes increased. Plantar responses flexor. Abdominal reflexes present. Rombergism ++. No fibrillary tremors.

A fractional test-meal gave a very low acid curve. Cerebrospinal fluid and blood-count normal. Wassermann reaction negative.

Bulbar symptoms were present, and there was a general similarity to amyotrophic lateral sclerosis with sensory changes.

CLINICAL FEATURES

The most constant finding was impairment of visual acuity due to central and paracentral scotomata, the peripheral fields remaining full. The fundi showed partial optic atrophy and in many cases macular degeneration was present. On account of this finding we have not ascribed the optic atrophy to retrobulbar neuritis as other authors have done, since the pathology appears doubtful. Deafness was usually bilateral and of the nerve type. The paræsthesiæ, sensory loss of stocking type, ataxia, foot-drop, and loss of deep reflexes were characteristic of polyneuritis, but tenderness of the calves was not seen. The patients' description of the "electric feet" strongly resembled the pain of "immersion foot." Some cases showed increased deep reflexes, spasticity, and ataxia out of proportion to the degree of anæsthesia, and in these it was thought that the cord must have been damaged. Some of these cases showed a striking similarity to subacute combined degeneration, although an extensor plantar response was never seen. Case 6 began with the typical story of failing vision, numbness of the legs, and ataxia; but the signs at the present time closely resemble amyotrophic lateral sclerosis with bulbar palsy and additional sensory signs. Several similar cases were seen by Australian doctors in prisoners-of-war, and it is thought that the condition is but a variant of the more usual form of the neuropathy.

Blood changes were not significant, and no definite relationship between the severity of symptoms and achlorhydria was noted. No abnormality was ever noted in the cerebrospinal fluid. An earlier investigation in H.M.H.S. *Oxfordshire* shortly after the prisoners' release showed no general lowering of the level of plasma proteins, and œdema was never a very prominent symptom.

One interesting feature was that in 1943 diphtheria raged through the camps, and owing to lack of antitoxin treatment was inadequate; despite this there was no recrudescence of polyneuritis.

TREATMENT

Since their release the patients have been under observation for two months, during which time they have been on a high-calorie diet and massive-vitamin therapy. Liver extract was also given in many cases. Patients with ataxia and muscle weakness were instructed in re-educational exercises, and every effort was made to rehabilitate them generally. The results on the whole have been disappointing; subjective improvement has taken place in some cases, but the neurological signs have remained unchanged, vision in particular not showing any response.

DISCUSSION

The syndrome seen in these patients is identical with that described by Spillane and Scott (1945) in German and Italian prisoners-of-war in Allied hands in the Middle East. There can be little doubt that, when a group of previously healthy men, living on a monotonous and inadequate diet, develop similar symptoms, a dietary deficiency or intoxication is the likely cause.

In Hong-Kong the diet was grossly deficient in protein, fats, and all parts of the vitamin-B complex; in Spillane and Scott's cases, though the food on paper was excellent, supplies were not available, and the amount actually received by the men was inadequate.

Although it would be easy to ascribe the syndrome to a pure vitamin deficiency, in our opinion there are serious objections to this hypothesis. Thus, several of our patients developed fresh neurological symptoms and signs while on an adequate intake of synthetic vitamins in the camp hospital. Again, vitamin therapy given to established cases in the camp cured the tongue and scrotal lesions but caused little improvement in the neurological signs. Further, the neurological symptoms developed in almost epidemic proportions within a few months of captivity, reached a maximum, and then tended to remain stationary or improve slightly despite steadily decreasing diet. All this suggests the presence of a toxic agent which was operative more in the earlier months of captivity.

The literature on beriberi and allied disorders provides further evidence in this direction.

(1) Taguchi and his colleagues (1922) produced neuritic symptoms within 4–5 days in volunteers fed on overmilled rice. This seems too short a time for a deficiency disease to develop.

(2) Beriberi broke out in a community in Sierra Leone in 1931 where the diet had been expressly designed to ensure an adequate intake of vitamin-B complex. The disease in some was controlled by removing the pericarp of the rice and discarding the water in which the grain was cooked. This extract was toxic to animals.

(3) Beriberi does not develop in simple starvation; shipwrecked sailors who have lived for incredible periods on rafts on a starvation diet do not develop beriberi. Fraser and Stanton in 1911 showed that fowls fed on water lived longer than those fed on polished rice.

(4) Walshe (1941) points out the likelihood of a toxic factor being present in all forms of polyneuritis. The mode of onset, physical signs, and progress in our cases strongly suggest a toxin, and there is considerable resemblance to similar diseases caused by known toxins. Among these are (*a*) lathyrism, a paraplegia associated with dimness of vision due to the consumption of a vetch or some varieties of pea (pulses formed a proportion of the diet in the Far East, and lathyrism has been described in Italy, Persia, and India when wheat flour has been adulterated with pea flour); and (*b*) Scott's palsy, a neuritic condition described by Moore (1937) as developing in Nigeria in those living on the tubers of the cassava plant. Clark (1941) found that cassava inhibited the action of nicotinic acid, and therefore more nicotinic acid was required to prevent deficiency symptoms in animals fed on cassava.

(5) There is a conspicuous relationship between a high carbohydrate diet and the onset of beriberi, which develops

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but rarely in those on a deficient diet with low carbohydrate intake.

In view of this evidence we believe that in the neuropathy under discussion there is a toxic or antivitamin principle in the diet—in our cases the rice—comparable to that described by Clark in cassava, which inactivates what little vitamin-B complex is present. Further, the low protein intake probably denudes the alimentary tract of its usual proportion of *Bact. coli*, and synthesis of thiamine in the gut is therefore diminished. The lack of thiamine leads to inadequate carbohydrate metabolism, with the resultant formation of pyruvic acid (Peters 1936, 1939). This interferes with the life of the nerve-cells and is probably the final common factor in all cases of polyneuritis.

If the toxic agent or antivitamin factor postulated in these cases could be discovered, it might shed light on the ætiology of other conditions, such as subacute combined degeneration of the cord, amyotrophic lateral sclerosis, and disseminated sclerosis, which some of our cases clinically resembled so closely. It seems possible that in these better recognised illnesses we may be dealing with metabolic upsets, of which only the end-results are at present apparent. Further work into their earlier manifestations might therefore be profitable.

SUMMARY

A nutritional neuropathy in a group of repatriated prisoners-of-war from Hong-Kong is described.

The response to dietetic and vitamin therapy was poor.

The similarity between these cases and other known neurological disorders is discussed.

The condition is considered to be due to a deficient diet containing a toxic or antivitamin principle, together with lack of vitamin-B complex.

We are indebted to Surgeon Commander L. P. Spero, R.N., for the ophthalmological reports; Captain G. T. Balean, H.K.V.D.C., for first-hand information about conditions in Hong-Kong; the medical officers of the camp hospitals and Surgeon Lieut.-Commander P. Jones, R.N., of H.M.H.S. *Oxfordshire*, for their excellent case-notes; and Surgeon Rear-Admiral J. A. Maxwell and the Medical Director-General of the Navy for permission to publish the cases.

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TOLERANCE TO OCTYL NITRITE IN ACHALASIA OF THE CARDIA

REPORT OF A CASE

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FOUR cases of achalasia of the cardia treated with inhalations of octyl nitrite have been reported by Field.[1] In all of them the relief of spasm was confirmed by radiography. In Field's cases no tolerance to octyl nitrite was observed, and the side-actions were negligible, except that in all cases a cold or a sore throat developed within 1–2 weeks of the start of treatment.

In June, 1945, an opportunity was provided for a careful observation of the action of octyl nitrite in a case of achalasia of the cardia. The diagnosis was proved at necropsy. In this case definite tolerance was produced quickly, and inhalation of octyl nitrite, pushed to the limit of the not inconsiderable side-actions, in less than three weeks had no effect on the patient's condition. The initial success and the ultimate complete failure of the drug were striking.

Method of Administration.—Ampoules of octyl nitrite (the nitroso-ester of 2-ethyl-n-hexylnitrite) were broken in a handkerchief and the contents inhaled. Each ampoule contained 3 minims. Field's cases used an inhaler, in which the concentration varies after use, but we were able to observe the effects of known quantities of the drug.

CASE-RECORD

A girl, aged 13, was admitted to the Royal Victoria and West Hants Hospital with six years' history of difficulty in swallowing, associated with pain between the shoulder-blades. She also had a history of petit mal and for some months had had chronic constipation and a troublesome cough. Weight 5 st. 13 lb. The girl was thin, of poor general development, and retarded intelligence, and approached every meal with trepidation.

On examination the percussion note was impaired over the right middle lobe, with crepitations attributed to œsophageal pressure. Her abdomen was slightly distended, and a mass of fæces was easily palpable in the right iliac fossa. Temperature 100° F.

Radiography of her chest showed chronic congestion of her right middle lobe and thickening of the upper part of the mediastinum. Sputum was repeatedly negative for tubercle bacilli. Wassermann reaction negative. Erythrocyte-sedimentation rate (Westergren) 3 mm. in 1 hour and 12 mm. in 2 hours.

Barium Swallow.—The œsophagus was much dilated throughout its length and contained residual fluid. There was well-marked obstruction at the cardiac orifice, the lower end of the œsophagus being smooth and tapering. No evidence of tracheal displacement or narrowing. Upper part of mediastinum widened owing to outline of œsophagus. Œsophagoscopy and bronchoscopy confirmed the diagnosis of achalasia.

Treatment.—Patient was treated with a belladonna mixture which gave very slight relief. Her chest condition cleared with a course of sulphathiazole, and she was transferred to Brompton Chest Hospital for further investigation and treatment. Barium swallow confirmed the findings already observed, and œsophagoscopy by Mr. Tudor Edwards showed the œsophagus to be grossly dilated and to contain masses of inspissated food. The œsophagus could be seen moving where it passed through the diaphragm, and a large bougie was passed without difficulty. Within a fortnight the child was very good at swallowing the bougie and had not vomited since starting to use it.

After she had used the bougie for a month her general condition had greatly improved. Weight 6 st. 4½ lb. Radiogram of chest was clear, and she was discharged with instructions to use the bougie and to continue with the belladonna mixture. Her cough, however, returned, and her weight dropped again to 5 st. 12 lb. Barium swallow showed no change in the appearances of the œsophagus, and she was readmitted to this hospital six months later. She was unwilling to persevere further with the bougie.

By this time some octyl nitrite had been obtained, and a trial was made.

Radiography.—The patient was screened in the upright position, right anterior oblique. An ampoule of octyl nitrite was inhaled, and exposures were taken immediately and at ½-min. intervals. The cardia began to open after 1½ min. The patient had pain after swallowing, but the opening of the cardia coincided with the relief of pain, and all the barium entered the stomach in 4 min. No unpleasant sensations were described, blood-pressure did not fall, and pulse-rate remained steady.

The swallow was then repeated, this time two ampoules being inhaled in quick succession; 4 sec. after inhalation of the second ampoule the cardia had opened fully, and ½ min. later all the barium was in the stomach. A second swallow 1 min. later showed that the cardia was still dilated and barium flowing freely into the stomach. After two ampoules the patient complained of fullness in the head and a "sinking feeling." There was a slight fall in blood-pressure, and the pulse-rate rose. There was no pain on swallowing.

Treatment with Octyl Nitrite.—Regular treatment was started with octyl nitrite. One ampoule was inhaled 5 min. before each meal. Complete relief was obtained. A mixed

1. Field, C. E. *Lancet*, 1944, ii, 848.

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meal of meat, vegetables, and bread and butter was eaten without discomfort. No unpleasant sensation was felt, and the child was so pleased with life that for the first time in our experience she smiled. The bougie was discarded.

For two days all meals were taken easily, but on the third day the patient was unable to finish the meal and began to complain of pain towards the end. On the fourth day two ampoules were inhaled 5 min. before each meal. There was complete relief of all symptoms, but the girl complained of fullness in the head and flushing. For ten days she ate all meals with pleasure and became happy, responsive, and talkative.

At the beginning of the third week of treatment she complained of being unable to finish the meal. Pain had returned. After twenty-one days' treatment inhalation of two ampoules of octyl nitrite produced no relief, and a meal could not be eaten without swallowing the bougie; in fact she was in exactly the same condition as at the beginning of treatment. A further barium swallow could not be given, because the girl had reached the tolerance for X rays, above which it was considered inadvisable to go. She became unhappy and morose and sulked and cried for most of the day. Her cough returned and became greatly exacerbated. Three days later she began to have continuous abdominal pain and to vomit after all meals.

Heller's operation was performed by Mr. N. F. Adeney. The lower end of the œsophagus was exposed through a left paramedian incision. Slight muscular hypertrophy of the lower end was found, and the highest part of the œsophagus seen (about 1½ in. above the cardia) showed no dilatation. The muscle-fibres over the last 1½ in. of the œsophagus and the first inch of the stomach were divided. The width of the mucosa exposed varied from ½ in. above to 1 in. at the lower end, and the mucosa bulged as in a Ramstedt's operation. Convalescence was uneventful, and a month later she was discharged from hospital able to take meals with comfort.

Ten days after discharge she was readmitted with epigastric pain. Her abdomen was greatly distended, and fæces were easily palpable through the abdominal wall. Repeated enemata produced good results, but her distension was only slightly reduced. A week after admission her pain increased, and she developed signs of free fluid in the peritoneal cavity, but she was eating and feeling well. Four days later she became distressed, and paracentesis abdominis produced thin serous fluid which contained pus-cells but no organisms and was sterile on culture.

Laparotomy was performed by Mr. Adeney, and thin sanious pus with fibrinous deposits was found in the peritoneal cavity. The small intestine was distended. The cæcum was impacted with hard fæces, and the whole of the large bowel except the cæcum was distended with fæces. An ileostomy was performed and a drain inserted in the mid-line through a stab wound.

Next day her condition was poor and her distension not in any way relieved. Her distension continued to increase, her condition deteriorated, and six days later she died.

Necropsy.—Free fluid was found in the peritoneum, with fibrin flakes. There were recent massive adhesions in the region of the stomach; liver, gall-bladder, stomach, spleen, omentum, and transverse colon were matted together. The small bowel was grossly distended, and the large bowel distended, hypertrophied, and filled with putty-coloured fæces.

On separation of the adhesions under the diaphragm foul fluid escaped, and the whole of the lining of the lesser sac was stained and necrosed; stomach contents were escaping from a perforation just behind the lesser curvature, in the mid-zone, 3 in. from the site of the Heller's operation. There was no fibrosis round the perforation, but a few petechiæ were seen.

The muscular coats of the stomach and œsophagus divided at the Heller's operation had rejoined and showed a fibrous scar, the cardia barely admitting a finger. The œsophagus was not greatly dilated, but was hypertrophied. There was no evidence of stricture.

There was a small pleural effusion on either side of the chest, and all lobes of the lungs, more particularly the right upper and middle lobes, showed nodular induration, and on section the tissue was hard and crisp, suggesting interstitial fibrosis. There was early bronchopneumonia of the left base.

COMMENT

The patient had had, from time to time during her long history of achalasia, chronic constipation with distension and palpable masses of fæces in the abdomen. The large gut presented the appearance of Hirschsprung's disease. The association in this case of achalasia of the cardia and megacolon suggests that there was a general neuromuscular imbalance throughout the intestinal tract responsible for the two separate clinical conditions, an association pointed out by Rake,[2] who considers the two conditions analogous.

CONCLUSIONS AND SUMMARY

Octyl nitrite, previously reported in the successful treatment of achalasia of the cardia, was given a clinical trial on a case in which the diagnosis was subsequently proved at necropsy.

Known amounts of octyl nitrite were inhaled, and opening of the cardia was observed by radiography. Complete relief was given at first, but tolerance was rapidly produced, first to a minimal effective dose, and then to twice that dose. Finally the drug ceased to be effective.

Owing to shortness of supplies and the comparative rarity of the condition, a series of cases could not be tested; but it will be interesting to see whether octyl nitrite produces rapid tolerance in a proportion of cases of this condition and will therefore only be a practicable form of treatment in a proportion.[3]

We wish to thank Dr. Joan Lassetter for the radiography; Mr. N. F. Adeney for permission to publish the report of the operation; and Dr. E. Minchin for performing the necropsy. Ampoules of octyl nitrite were kindly supplied by British Drug Houses Ltd.

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of medicine on April 30, a paper on

Ulcerative Colitis Treated with Intestinal Mucosa

was read by Dr. A. MORTON GILL. He said that consideration of the natural course of ulcerative colitis, with its spontaneous remissions and relapses, suggested that, at least in some cases, it might be the result of deficiency. Nine years ago he had seen a patient who had had the condition for three years, without responding to treatment, which had included a year in hospital. This patient was given raw pig's small intestine by mouth. The condition remitted as long as he continued the treatment, but relapsed when supplies failed; relapse and remission were repeated when treatment was voluntarily discontinued and then reinstituted. At that time dried preparations of pig's intestinal mucosa became available. Of two preparations (A and B),[4] enzymal activity was retained in one (A). With "A" there was little or no improvement, but with "B" there was complete remission within one month.

Of 5 further cases treated with raw pig's small intestine, 3 responded and 2 were not improved. Of 3 further cases treated with preparation "A," none showed material improvement. Of 12 cases given preparation "B," 8 recovered, and remain well as long as they continue the treatment.

Dr. Morton Gill concluded that the term "ulcerative colitis" includes more than one disease, or alternatively that the ætiology of the condition varies; in one group the cause may be an unspecified deficiency. No advantage is to be gained from increasing the daily dose of desiccated mucosa beyond 1 oz. (equivalent to ½ lb. raw material); on the other hand, a small daily dose, such as 1 drachm, is useless. There is always a latent interval of about three weeks between the commencement of treatment and appreciable improvement. Mucosa from all anatomical segments of the small intestine is effective, but possibly jejunal mucosa produces the most lasting effect.

2. Rake, G. W. *Guy's Hosp. Rep.* 1927, 77, 141.
3. Since this paper was written a further case of achalasia, in a woman aged 32, has been tested with an octyl nitrite inhaler, and so far (six weeks) no tolerance has been noted (Dr. B. E. Tompson's case).
4. Gill, A. M. *Lancet*, 1945, ii, 202.

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A new highly concentrated preparation (Allen and Hanburys) is now on trial.

AT a meeting of the section of neurology on May 2, with Dr. J. PURDON MARTIN, the president, in the chair, a discussion on the

Surgical Treatment of Myasthenia Gravis

was opened by Mr. GEOFFREY KEYNES. In his series of 63 cases treated by removal of the thymus, the mortality had fallen from 7 in the first 21 to only 2 in the next 42. Of the 41 cases that remained after excluding 9 recent cases and 13 that had died, 29 were either cured or so much improved that they needed only minimal doses of 'Prostigmin'; only 12 showed little or no improvement. Patients who had been seriously ill before operation had mostly done far better than could be expected from spontaneous remission. The best results were obtained in young individuals with short histories, and the worst in older people with long-standing disease; but all the material was from the severely ill, since the milder cases had naturally not come to operation. The results were inexplicably erratic. Ptosis in particular tended to remain, even when other symptoms had improved. It was clearly advisable to operate early when the general condition was still good and the possible development of a thymoma could be forestalled. One in 10 of these cases had associated thymic tumours, which were adherent to the pleura and difficult to remove and which adversely influenced the prognosis for no very clear reason; there might be relief for a month or two and then sudden relapse and death. In non-tumorous cases the size of the gland was not related to the operative result or to the histological findings after removal. It had been said that the disease did not occur in children, but two moribund infants, aged 2 and 4 years, had been almost literally snatched from the grave by operation.

Dr. D. H. COLLINS remarked that the normal thymus was unfortunately not a familiar entity; the ordinary postmortem specimen was worthless, and only fresh material from young adults who had died suddenly was of any use. In myasthenia gravis gross structural abnormality was the exception, but the histological characteristics of a myasthenic gland could now be distinguished with fair certainty. There was an unusually dense concentration of lymphocytes in the cortex of the residual islets; and within the medulla were formed structures which resembled the germinal centres of lymph-glands, with clear areas and mitotic and vacuolated, almost syncytial, lymphoid cells. These changes were present in 66% of the non-tumorous myasthenic glands, but their meaning was obscure, especially since the normal functions of the organ were unknown; they might be the result rather than the cause of the disease.

Sir CHARLES SYMONDS said there was no question that the operative results were incomparably better than those of medical treatment, though the infrequency of the disease made assessment difficult. Of 30 cases seen before the war, only 2 were known by him to be still alive; one of these had been slightly improved by operation, while the other was an instance of the exceedingly rare spontaneous remission.

Dr. L. P. E. LAURENT, on the basis of 65 personal cases observed over 18 years, was more optimistic. He suggested that natural remission was perhaps not so unusual; he had known several patients who had recovered spontaneously and subsequently led a long and busy life. It was possible that Keynes's successes might be due to early operation, for remission was known to be commoner in early cases. Nor did thymectomy throw light on the fundamental observation by Dr. Mary Walker that in myasthenia a substance is liberated into the bloodstream from the contracting muscles which still further depresses the myoneural junction.

The PRESIDENT pointed out that a number of questions remained to be answered before the value of operation could be properly assessed. The previous mortality was unknown; nor did we know the previous rate of spontaneous remission or the fate of non-operated controls. It might be that some patients unresponsive to operation had remissions later. He was convinced that the operation was a great advance, especially in the treatment of cases which had previously been the most fatal. But thymectomy was not a cure; nor could it be said that myasthenia depended entirely on the thymus. Of the acute cases of myasthenia, the vast majority were fatal, and most of these deaths occurred before the age of 25; it was these younger patients who were most benefited by operation, which was often a dramatic and life-saving procedure. But when myasthenia had passed into the chronic stage, thymectomy caused little relief, and any later improvement was probably due to spontaneous remission.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

AT a meeting in Leeds on April 5, a discussion on

Treatment of Cancer of the Cervix Uteri

was opened by Mr. D. W. CURRIE. He described a series of 41 cases on which he had performed a Wertheim's hysterectomy with no primary mortality. Of these, 8 had died of the disease; 6 of the 11 that had undergone operation five or more years ago were still alive. He considered that this operation was the treatment of choice in early cases, and that it should be preceded by treatment with radium to clear up sepsis and to minimise the risk of implantation of cancer cells in the vault of the vagina.

Dr. G. W. BLOMFIELD emphasised the importance of obtaining a reliable opinion on the likelihood, judged by biopsy, of the cancer cells reacting favourably to radiation. He suggested consultation between the gynæcologist, radiotherapist, and pathologist before the form of treatment was decided.

Mr. CURRIE deplored the fact that many patients were sent for treatment with radium without a gynæcologist's opinion on the advisability of operation.

Members expressed the view that Mr. Currie's figures proved that the risk of a Wertheim's hysterectomy, when performed by an expert surgeon, was no greater than that of an ordinary hysterectomy.

LIVERPOOL MEDICAL INSTITUTION

AT a meeting on April 25, with Dr. G. F. RAWDON SMITH, the president, in the chair, papers were read on

Penicillin in Subacute Bacterial Endocarditis

Dr. G. SANDERSON described 20 cases treated on behalf of the penicillin clinical trials committee of the Medical Research Council.[1] Of these, 8 had died, and 12 had survived for periods ranging from a few weeks to over a year. Of the 8 female cases 5 had died, and of the 12 males 3 had died. Three cases with congenital heart disease had all done well. It was impossible to estimate with any precision how patients would react to treatment. Penicillin was given in the earlier cases by continuous intramuscular drip, and subsequently by 3-hourly intramuscular injections into the thigh. Patients much preferred the latter technique.

Major embolic accidents had occurred in 7 cases. One patient, who had a subarachnoid hæmorrhage during treatment, has residual diplopia and difficulty in walking. A second patient developed during convalescence recurrent massive hæmaturia; a left renal aneurysm was found at operation for nephrectomy, after which the patient recovered completely. These 2 cases illustrated "recovery with sequelæ." Physicians and surgeons would need to be aware of this new syndrome, which sometimes occurred in successfully treated cases. Consideration of the 8 cases that had died indicated that most deaths were not due to failure of penicillin, and suggested that even with optimum dosage a considerable mortality—probably about 25%—must still be anticipated.

Of the Liverpool cases treated with 500,000 units daily for ten days, 3 out of 5 had recovered; but no other centre had had any success with this regime. The present tendency was towards larger doses over longer periods.

Dr. M. G. MCENTEGART drew attention no the apparent lack of correlation between the coefficient of resistance of the infecting organism (within the limits

1. See *Lancet*, March 16, 1946, p. 369.

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shown by organisms isolated from Liverpool cases) and the ultimate outcome. Observations on serum penicillin levels suggested that the onset of renal failure was accompanied by some degree of penicillin retention.

The PRESIDENT commented on the greater success in the earlier cases than in the later ones. Penicillin might be partially responsible for the emboli so often observed. It was surprising that extensive dental extractions were considered an ætiological factor in infective endocarditis, since this was not recognised at the Liverpool Dental Hospital.

Dr. H. FULD said that one patient, who had been seen by him before admission to hospital with infective endocarditis, had had a tooth extracted for apical abscess three weeks before the onset of symptoms. He felt that dental surgeons should be acquainted with the relationship between oral sepsis and subacute bacterial endocarditis, which had been emphasised in America.[2] In future "oral clearance," particularly in patients with congenital heart disease or with a history of rheumatic fever, should be considered an operation requiring pre- and post-operative penicillin therapy. Total clearance at one sitting should now be a matter of the past. He inquired if in Dr. Sanderson's series suspected teeth had been removed before treatment was completed, in order to diminish the threat of reinfection of the heart valves.

Dr. R. M. EVANS recalled 2 cases of apparent cure in which sudden onset of congestive cardiac failure several weeks after the end of penicillin treatment was found at autopsy to be due to a ruptured aortic cusp. Vegetations were found in neither case. The bacterial infection had apparently been abolished, but had left the cusps damaged by scarring.

Reviews of Books

Pulmonary Edema and Inflammation

CECIL K. DRINKER, M.D., D.SC., professor of physiology, Harvard University, Boston, Mass. London: Oxford University Press. Pp. 106. 14*s*.

PULMONARY œdema produces such serious symptoms, and when it develops suddenly, such alarming effects, that understanding of the mechanism of its development is of great practical importance. This monograph, embodying the Nathalie Gray Bernard lectures, is the result of long experimental and clinical studies by Professor Drinker and his co-workers. He maintains that the endothelial lining of the pulmonary capillaries is particularly vulnerable to anoxia. This endothelium depends for its oxygen-supply on the air reaching the alveoli, and not, as in the capillaries of the rest of the body, upon oxygen brought by arterial blood. When transudates or exudates escape into the alveoli and reach the bronchioles, air is excluded from the alveoli and the local anoxia increases capillary permeability. Such exudates and transudates depend for their removal on the lymphatics, which are extensive in the lungs though they do not reach the actual alveoli. The right lymphatic duct, on which they converge, is small enough to form a bottleneck for lymph drainage from the lungs. He accepts the idea of alveolar pores or communications between adjacent alveolar groups, and thinks they mitigate the effects of bronchiolar obstruction.

Among physical factors promoting escape of fluid through the capillary walls he discusses the relatively insignificant arteriolar circulation from the bronchial arteries, the enormous capillary area—estimated at about 140 sq. metres—with its low capillary blood-pressure, and the variable negative intrathoracic pressure which tends to draw fluid out of the pulmonary blood-flow. Some ingenious experiments demonstrated that increased pressure in the pulmonary capillaries does not readily cause pulmonary œdema, unless it is associated with increased endothelial permeability, usually the result of anoxia. A substance allied to thiourea was found to induce fatal pulmonary œdema with pleural effusion when injected into dogs. Using it Professor Drinker demonstrated than when pulmonary capillary leakage of protein-laden fluid is excessive, lymphatic drainage from the lungs by the right lymphatic duct becomes gravely inadequate. He advocates changing the position of the patient in bed, and recalls that a few deep breaths will prevent stasis and atelectasis, the common antecedents of œdema. Oxygen, he believes, should be used early, and thinks that the patient with irritative conditions, due to inhaling chlorine or other irritating gases, may be helped by breathing oxygen under pressure. Finally, he discusses the methods of artificial respiration, including mechanical appliances like the Bragg-Paul, the London County Council cuirass, and the Drinker-Shaw respirators. The book is a thoughtful, interesting, and suggestive contribution to a difficult subject.

2. Favour, C. B., et al. *New Engl. J. Med.* 1946, **234**, 71.

Textbook of Medical Treatment

(4th ed.) Editors: D. M. DUNLOP, M.D., F.R.C.P.E., professor of therapeutics and clinical medicine, University of Edinburgh; L. S. P. DAVIDSON, M.D., F.R.C.P., professor of medicine and clinical medicine, University of Edinburgh; J. W. MCNEE, M.D., F.R.C.P., regius professor of medicine, University of Glasgow. Edinburgh: E. & S. Livingstone. Pp. 923. 30*s*.

THE new edition of this deservedly popular work from the Scottish school of medicine well maintains the standard of its predecessors, and for a textbook produced under present conditions is remarkably up to date. Penicillin, thiouracil, and D.D.T. are all covered, though there is no reference to methyl thiouracil; thrombophlebitis is only mentioned indirectly and little enthusiasm is shown for the use of heparin. The index contains two "sins"—one of omission and one of commission—scarcely in accord with the best Scottish traditions: "angina pectoris" is not to be found, while "angina innocens," a term which is anathema to cardiologists, is perpetuated. The table of official preparations and their proprietary equivalents, though incomplete, is retained. For reliability and clearness this continues to be a textbook of choice for both student and practitioner.

Green-Belt Cities

F. J. OSBORN. London: Faber. Pp. 191. 12*s*. 6*d*.

MUCH has been written on green belts in the past few years. Amid the clashing swords of the experts the public is fast becoming confused rather than enlightened, and it is refreshing, therefore, to turn to this book by Mr. Osborn, who is in the true succession from Ebenezer Howard with whom he worked. Indeed, he has developed the thesis in greater detail than Howard himself, and it would be difficult to better his succinct and complete survey of town and country planning for social and industrial life. The green-belted garden city seems to be the only rational plan for a highly industrialised country such as ours. We cannot reconstruct our large old cities without building new towns for those we disperse in the process. In correcting the worst consequences of the industrial revolution, we must sweep away large areas of drab and insanitary dwellings in our great cities. Mr. Osborn regards the Greater London plan of 1944, compiled under the guidance of Sir Patrick Abercrombie, as the first fully worked out garden-city plan for the metropolis. The appendices of his book trace the historical origins of the green-belt principle back to the days of Moses.

Lumbalgien

Dr. Med. HANS DEBRUNNER, Privatdozent für Orthopädie an der Universität Zürich. Berne: Huber. Pp. 106. Sw. Fr. 9.50.

Dr. Debrunner aims at giving an adequate survey of the problem of low back-pain as seen by the orthopædic surgeon; and his clear and well-illustrated account succeeds in doing this. Every aspect of the subject is covered, though the emphasis on each does not always accord with current trends in this country and the United States—a difference which may be the result of the relative isolation of Swiss surgery during the war years. More stress is laid on the importance of developmental errors in the lumbosacral region and on soft-part disorders—myalgia and periostitis—than is customary here; whereas the section on the intervertebral disk seems somewhat inadequate. Dr. Debrunner regards degeneration (or osteochondrosis) of the 5th lumbar disk, with narrowing of the lumbosacral interval and local symptoms, as an entity separate from retropulsion of the nucleus.

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THE LANCET

LONDON: SATURDAY, MAY 18, 1946

The Practitioner's Income

THE Spens Committee recommends that in a National Health Service the large majority of general practitioners should have higher incomes than they have earned hitherto. In forming this opinion it made use of Prof. A. BRADFORD HILL'S analysis of 3000 replies by practitioners to a questionary sent out by the British Medical Association; and though (as Prof. BRADFORD HILL emphasises in his statement) a third of those questioned did not give the required information, the committee thinks that the mean incomes revealed are unlikely to be far wrong. It appears that in the three years 1936–38 the mean net incomes of male doctors practising as principals were as follows:—

Ages ..	-34	35–39	40–44	45–54	55–64	64+
Urban areas	£959	£1158	£1175	£1220	£1006	£754
Mixed areas	£1012	£1192	£1256	£1255	£1260	£728
Rural areas	£839	£1038	£975	£1063	£928	£797

All these means lie between £700 and £1300, but the individual range was of course far greater; thus in urban areas there were 25 returns of net incomes below £100 and 4 of net incomes above £4000. The essential fact on which the committee fixes is that (again in urban areas) nearly 20% of doctors of 40–55 years of age were earning less than £700 a year (net), while over 40% had less than £1000. "Having regard to length of training, to the arduousness of the general practitioner's life compared with that in other professions, to the greater danger to health, to the skill and other qualities required and to the degree of individual responsibility" the committee holds that too many were receiving low incomes and that too few were able to reach £1300 a year (net) or more. The kind of distribution of incomes which the committee (with one dissentient) thinks desirable could have been reached before the war by adding £200 to incomes of £400–£1200, and a progressively diminishing amount to incomes of £1200–£2000; and the result of applying this formula is seen in detail in table B, summarised on p. 748. Writing in terms of the 1939 value of money, the committee illustrates its recommendation as follows:

> "The effect of our proposals can be put very simply by saying that between 40 and 50 years of age approximately three-quarters of general practitioners ought to have achieved a net income of over £1000 per annum, approximately half ought to have achieved a net income of over £1300 per annum, approximately a quarter ought to have achieved a net income of over £1600 per annum and slightly less than 10% a net income of £2000 or over."

While it refrains from any attempt to translate these money figures into their post-war equivalents, we may presume that if its intention is to be fulfilled they would have to be augmented substantially and so become distinctly more attractive. With additions of one-third, for example, the above sentence would read:

> ". . . between 40 and 50 years of age approximately three-quarters of general practitioners ought to have achieved a net income of over £1333 per annum, approximately half ought to have achieved a net income of over £1733 per annum, approximately a quarter ought to have achieved a net income of over £2133 per annum and slightly less than 10% a net income of £2666 or over."

To the many doctors who are accustomed to think of their gross incomes rather than their net profits, these figures may seem less impressive than they really are. To arrive at their equivalent in gross incomes we must add a proportion for expenses; and Prof. BRADFORD HILL'S analysis revealed no group in which the mean expenses of practice were less than a third of the total earnings. Allowing this minimal third of the gross income for expenses, and another third to compensate for the depreciation of money, the committee's net incomes of £1000, £1300, £1600, and £2000 at 1939 values would be worth the same amount as gross incomes of £2000, £2600, £3200, and £4000 today.

The committee justifies a "very considerable increase" in the total net income of practitioners largely on the ground that "even apart from any complications resulting from the general introduction of a publicly organised service, we do not believe that a profession involving the arduous life and the heavy responsibilities of general practice could permanently maintain its recruitment in present conditions, either as against other professions or as against other branches of the medical profession, with so high a proportion of low incomes in middle age as the payments before 1939 in fact produced." The dangers are first that the best recruits will not enter medicine at all, and secondly that all those who do so will decide to be specialists. These arguments, however, do not convince the dissenting member of the committee, Sir ERNEST FASS, who has Treasury associations. The fact that we are to have a National Health Service is, he believes, "no cause for varying the relativities either between the professions or within the medical profession itself." Having in mind the salary scales laid down last autumn for doctors working in the hospitals of the Middlesex County Council, he suggests that, in terms of 1946 money, 50% of practitioners should earn less than £1200, and 80% less than £1800, while 7·5% should get more than £2200 and 2·5% more than £2500.

Although the committee was not asked to consider *how* practitioners should be paid, its report is highly relevant to this problem. Many have expected that it would propose a scale of remuneration on which incomes would rise according to seniority, recognised merit, or special qualifications. But it favours nothing of the kind: "we are satisfied that there is a far greater diversity of ability and effort among general practitioners than admits of remuneration by some single scale applicable to all." The "most obvious method" of securing differentiation of earnings according to ability and effort is payment partly or wholly by capitation fees, and while the committee expresses no opinion whatever on the merits of this method it endeavours to show how the capitation system can be made to yield the improved distribution of incomes which it desires. Certain special arrangements

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are recommended to reduce the differences between urban and rural practices; it is proposed that the Highlands and Islands scheme should be applied to other sparsely populated areas; additional remuneration will be needed for unattractive localities; and adjustments will be required at health resorts or other places where doctors look after an altogether abnormal number of invalids and old people. Leaving these particular problems for particular solution, the main difficulty of payment by capitation arises at the top and bottom of the income range. At the bottom it could be met if practitioners could qualify for "some augmentation of income which was independent of capitation"; for example, a bonus of £100 could be paid to those who have attended a refresher course within the last three years, or a grant could be made towards professional expenses where these represent an abnormally high proportion of receipts. But, at the top of the income range, how could we maintain the proportion of practitioners earning over £2000 a year, net, at pre-war rates? In a public service the number of patients that a single doctor can be allowed to look after must be limited; and "this number may well not be sufficiently large to provide high incomes in the absence of a considerable amount of private practice." Unlike the Government white-paper, which suggested a diminishing capitation-rate as the doctor's list grows, the Spens Committee is at pains to see how he can be additionally rewarded for special popularity with the public. And its answer is—by taking an assistant. The committee would like to see every newly qualified doctor—and certainly every recruit to general practice—spend at least a year as assistant to an established practitioner, who would pay him £500 for the first year and £600 for the second. While every practitioner would be free to engage an assistant on these terms, some 10%, selected because of their success in practice and general suitability, would be encouraged to do so by receiving a supervision fee of £100 a year. Since, however, it would take time to enlarge a practice sufficiently to bear the expense of paying an assistant £500 a year (plus perhaps £250 expenses), it is suggested that a practitioner who has been approved for this purpose and who has not previously had an assistant should receive, besides the £100 supervision fee, a subsidy of £500 in the first year, £300 in the second, and £100 in the third. "We believe that some such system would improve training, would enable the most successful practitioners to treat or supervise the treatment of considerably more patients, thus making their services more widely available, and would meet the difficulty we anticipate in securing that incomes substantially over £2000 will continue to be obtainable in general practice."

The cost of these payments, for a service covering 45 million people, is put at 15*s.* 6*d.* a head, of which 6*d.* is for special purposes and 15*s.* for the ordinary remuneration of the practitioner. If such remuneration were solely by capitation, the fee payable would thus be 15*s.* in 1939 money, or £1 if this were increased by a third to give a corresponding value for 1946. But in all these calculations we are of course going too fast if not too far. In the first place the Treasury is not unlikely to resist any suggestion that the addition of as much as 33% is necessary because of the rise in prices during and since the war, and the Government may not agree that there is a special case for improving the lot of general practitioners as a whole. The Spens Committee is purely advisory, and the MINISTER OF HEALTH has yet to begin his promised conversations with the profession on its findings. Whatever the outcome, however, we can be grateful to the committee for its discernment and understanding. The general practitioner of medicine bears a heavy burden of work and responsibility which will not be appreciably lightened for years to come; and his material rewards have been generally too low in relation to his training, skill, and unending labour. Sir WILL SPENS and his associates have recognised these facts, and have pointed out the risk that this calling may cease to attract the best men and women:

> "General practice is the foundation on which all else is built. If its recruitment is not maintained—alike in quantity and quality—both as against other professions and against other branches of the medical profession, no other health service, specialist or hospital service, however excellent, can make good the loss . . ."

Those whose aim is to build a better service will surely take heed of these words.

Threadworms

THE anal swab introduced by HALL,[1] now known as the National Institute of Health (N.I.H.) swab, has proved its value in the diagnosis of threadworm infestation. It consists of a piece of 'Cellophane' 25 mm. square folded over the end of a glass rod and held in place by a rubber band. The perianal skin is stroked with it and the cellophane is then removed and mounted in water or *N*/10 NaOH and examined for enterobius eggs adhering to it. The swab can be enclosed in a glass tube for transport to a laboratory. Used with care and experience, this swab gives reliable results, and it seems to be preferable to similar swabs made of other materials, such as Scotch tape. But the proportion of positives still depends on how often the swabbing is repeated.[2]

SCHÜFFNER and SWELLENGREBEL,[3] working in Amsterdam, where all the children are, they say, infected with *Enterobius vermicularis*, have observed that the female threadworm lays her eggs in a stream and that most of the 10,000–15,000 eggs of each female may be laid in a few minutes, forming dense heaps or clusters. Because of this clustering, and because the movements of the female are feeble before she dies when egg-laying is completed, the eggs may not be widely distributed over the perianal skin, so that the swab may pass between clusters and fail to detect their presence. For this reason light infestations especially may be missed. SCHÜFFNER and SWELLENGREBEL therefore devised a new method. Having wetted the perianal skin they massage it for 15 seconds with the finger to make an emulsion of the squamous cells, sweat, mucus, and fæcal matter present. Drops of this emulsion are then taken up with a small pestle, made by blowing out the end of a piece of thick-walled glass tubing, 10 cm. long, into a globe with a diameter of 1¾ inches; the lower half of this globe is ground rough to enable it to

1. Hall, M. C. *Amer. J. trop. Med.* 1937, **17**, 445.
2. Cram, E. B. *Amer. J. Dis. Child.* 1943, **65**, 43.
3. Schüffner, W., Swellengrebel, N. H. *Zbl. Bakt.* I Abt. Orig. 1943, **151**, 71; Abstr. in *Trop. Dis. Bull.* 1945, **42**, 922.

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dislodge material between the perianal folds. The drops of emulsion are transferred to slides for examination. They can be dried on the slides for transport to a laboratory, where they are again wetted with water or NaOH, but a better method is to mount them in cedar-wood oil; the oil does not clear the eggs, which appear like air bubbles. Its inventors claim that with this pestle method examination takes only about a third of the time taken with the N.I.H. swab. They examined 50 subjects with the N.I.H. swab in 578 minutes and the same 50 in 172 minutes with the pestle; this time included mounting the slides, which is not necessary for diagnosis. The examination of possibly negative subjects (e.g., after treatment) takes three to six times as long with the N.I.H. swab, because the whole of the cellophane strip must be searched. When 50 subjects were examined with the N.I.H. swab and then with the pestle, only 37 were positive with the N.I.H. swab, in spite of the fact that this was used first, whereas all 50 were positive with the pestle. Moreover, the pestle recovered four times as many eggs as the swab (3372 compared with 931), though from one subject the swab recovered 201 eggs to the pestle's 2, perhaps because the swab chanced to take up a cluster. The Americans [2] recommend 7–10 re-examinations with the N.I.H. swab before a negative result is accepted. SCHÜFFNER and SWELLENGREBEL claim that fewer re-examinations are needed with the pestle. They also claim that the pestle is simpler to use and is more easily cleaned and that it does not scratch the perianal skin as the sharp folds of the cellophane may do.

The Amsterdam workers have also [4] examined nail dirt and house dust for eggs of enterobius. They do not agree with the view that examination of nail dirt can replace that of the perianal skin in diagnosis—certainly not when children wear pyjamas at night. From their study of dust they conclude that the eggs are blown about everywhere, so that the height of the surface examined from the floor is immaterial. Large numbers of eggs were recovered from the dust of closets and school dining-rooms, but most of these eggs were empty and could not develop into adult worms; NOLAN and REARDON [5] found that 92% of eggs recovered from dust are not viable, but CLAYTON LANE [6] pointed out that the wetter and cooler the air the longer eggs will survive. SCHÜFFNER [7] says that the main source of eggs in dust is the anal region. Out of doors most of the eggs which pass into the air are lost, but indoors many are deposited in dust. The number of eggs found on a square foot of surface was 119 in a large school dining-hall, 305 in classrooms, and 5000 in closets. More eggs were found in girls' closets, although the girls were not more heavily infested than the boys. SCHÜFFNER suggests that the movements of female clothes favour the dissemination of eggs. These enclosed spaces are, however, used only for short periods. There is one even smaller space in which we spend half our lifetime—beneath the bedclothes—and this is an important source of air-borne infestation. Bed-making also favours dissemination of eggs. Dust-borne infestation is important, but it causes only light infestations. If, however, finger infection is added to it, a light infestation may become severe and active.

There is no satisfactory treatment of the threadworm carrier, who may be seriously worried at night by only one worm. We must try to limit the degree of infestation much as we try to limit infestation with hookworms in areas where it cannot be wholly prevented. For the relief of anal irritation SCHÜFFNER recommends small enemas of 30–50 c.cm. of water. Or the anus may be closed at night with ointments or suppositories. Discussing the frequency of enterobiasis in Germany during the war, which, together with air-raids, led to a serious loss of sleep and consequent loss of productive power, OXENIUS [8] recommends that a small cotton-wool compress smeared with benzocaine ointment and then dipped in benzocaine powder should be inserted into the rectum overnight. SCHÜFFNER condemns high enemas designed to get at the worms higher up the intestine; these should be treated with anthelmintics, of which gentian-violet seems to be the most effective, though it is by no means free from side-effects. Finger infection can be combated by cleanliness and washing the anal region immediately after rising, so that the child is provided with a personal "climate" more or less free of eggs during the day. Closely fitting drawers are worn at night. Such measures as treating the rest of the family, washing the anal region in the middle of the night, daily changes and sterilisation of bedclothes and underclothes, high enemas, changes of diet, and purges are all condemned by SCHÜFFNER because they may lead to threadworm neurosis in the mothers as well as in the children.

Surgery of Banti's Syndrome

WE used to be taught that Banti's disease, or splenic anæmia, was caused by an unknown toxin, that it started in the spleen giving rise to splenomegaly, and that it spread mysteriously to the liver to cause an atrophic cirrhosis. It was maintained that the anæmia was due to the hypothetical toxin and was aggravated by the gastro-intestinal hæmorrhages which resulted from portal obstruction. Many surgeons thought splenectomy, if done in time, cured the disease, but it did not always arrest the progress of symptoms. Cases were seen which resembled but did not tally exactly with Banti's original description. A condition like it was produced if the portal vein thrombosed, and similar symptoms were found to be caused by infestation with *Schistosoma mansoni*. The prevailing uncertainty was reflected in the adoption of the term Banti's syndrome to describe the splenomegaly, the anæmia, the gastro-intestinal hæmorrhages, the increasing hepatic damage, and the ascites which formed such a striking clinical entity.

Much light has been thrown on the problem by the work done at the spleen clinic of the Columbia-Presbyterian Medical Centre, lately reported by WHIPPLE.[9] It is now thought that Banti's syndrome is always due to portal obstruction, and that its hitherto puzzling variations—the varying speed of its course and the apparently unpredictable results of

4. *Ibid*, 1944, **151**, 114; Abstr. in *Trop. Dis. Bull.* 1945, **42**, 924.
5. Nolan, M. O., Reardon, L. *J. Parasit.* 1939, **25**, 173.
6. Lane, C. *Lancet*, 1944, ii, 511.
7. Schüffner, W. *Münch. med. Wschr.* 1944, **91**, 411; Abstr. in *Trop. Dis. Bull.* 1946, **43**, 233.
8. Oxenius, K. *Ibid*, 1944, **91**, 414; Abstr. in *Trop. Dis. Bull.* 1946, **43**, in the press.
9. Whipple, A. O. *Ann. Surg.* 1945, **122**, 449.

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splenectomy—depend on where and why the portal vein is obstructed. The more striking symptoms are always due to portal hypertension. The portal block may be intra- or extra-hepatic. Cirrhosis of the liver, the ætiology and classification of which is now receiving much attention, is responsible for intrahepatic portal obstruction and can be diagnosed with fair certainty if liver-function tests show hepatic insufficiency. The extrahepatic course of the portal vein may be obstructed by traumatic fibrosis of the pancreas, of which WHIPPLE records an interesting example; by thrombosis of the splenic vein, when a previous history of pancreatitis may provide a pointer; by cavernomatous transformation of the portal vein, a condition which must be new to most of us and on the cause of which WHIPPLE is not prepared to dogmatise; by congenital strictures in the region of the portal fissure, due to overactive closure of the fœtal ductus venosus and umbilical vein; or by the pressure of neighbouring abscesses, cysts, and tumours. The exact site of an extrahepatic block can seldom be decided before operation and often not even when the abdomen is open, but if the block is extrahepatic a patient may suffer from Banti's syndrome for years without showing pathological changes in the liver. The workers at the spleen clinic, among other fundamental work on the portal and splenic circulation, have produced experimental cirrhosis in dogs and seen the dogs progress to Banti's syndrome. From these animal experiments, and from observations with intravenous cannulæ on human beings at operation, they have found that the normal portal pressure of 80 mm. of water may be raised to as much as 500 mm. of water, the rise depending on the degree and speed of the portal obstruction and the ability of the patient to open up collateral channels.

Splenectomy for Banti's syndrome, the results of which have been so uncertain, will cure those cases in which the splenic vein only is obstructed, provided the left gastric vein does not open anomalously into the splenic vein. Obstructions at this site are rare, and if splenectomy is done for more proximal obstructions useful collateral channels may be damaged. Operations of the Talma or Morison variety, done to provoke traumatic adhesions and additional collateral vessels between the viscera and the parietes, have not often been successful. The injection of an œsophageal varix through an œsophagoscope will only block an important collateral channel. A number of attempts, with an occasional success, have been made to anastomose portal and systemic veins—e.g., the ovarian to a branch of the superior mesenteric. WHIPPLE now records that he has anastomosed the portal and systemic circulations in 10 cases of Banti's syndrome without an operative death. His success has been due to his coöperation with BLAKEMORE and LORD [10] in applying the latter's non-suture method of blood-vessel anastomosis to the portal system. This technique is now well known: the cut end of a vessel is threaded through a shouldered 'Vitallium' tube and turned back as a cuff over the end of the tube; the rigid endothelial lined channel thus formed is then tied into the recipient vessel, on either the end-to-end or end-to-side principle. The first 5 of WHIPPLE'S cases were end-to-end anastomoses of the splenic to the left renal vein, after splenectomy and left nephrectomy had been done. The last 5 were end-to-side anastomoses of the portal vein to the vena cava. Of these 10 cases, 6 have shown remarkable improvement and it is clear that a man with an Eck's fistula can live as happily as a dog with one. These procedures are as yet purely experimental and have been carried out only in patients who have had repeated hæmorrhages and for whom conservative measures offered no hope. But the results are of great interest to both the surgeon and the physiologist. It is to be hoped that suitable vitallium tubes will soon be available in this country to give those suffering from an advanced Banti's syndrome their only hope of survival.

10. Blakemore, A. H., Lord, J. W. *Ibid*, p. 476.

Annotations

CELEBRATION

IN 1923 the Royal Hospital of St. Bartholomew celebrated the 800th anniversary of its foundation with festivities lasting three days. In 1946 the same hospital has just celebrated, more modestly as befits the times, the 400th anniversary of its second foundation. During the reign of King Henry VIII the hospital, founded with the help of his ancestor King Henry I, had fallen on very evil times, having suffered, together with its parent priory, confiscation of its property and income. The hospital came near to passing out of existence, until at the eleventh hour King Henry VIII was persuaded to undo part of the harm he had done by granting a royal charter for its refoundation. This was in 1546 when Henry was himself a sick man, and so the more ready to listen to the petition of the people of London, who found they were unable to do without their already ancient hospital. So Henry the Destroyer became also Henry the Founder, and his memory is held in honour in the hospital today.

On May 8, 1946, before a large and distinguished audience which included the King and Queen, were enacted some episodes in the history of the hospital. The commemoration was held in the Norman Priory Church of St. Bartholomew the Great before the tomb of Rahere, the first founder; and a more remarkable setting for such a ceremony can hardly be imagined. At eleven o'clock a procession was formed in the hospital by representatives of various bodies and institutions, including the Royal Colleges of Physicians and Surgeons, many City companies, the Lord Mayor of London with aldermen and sheriffs, and past and present members of the staff of the hospital, both lay and professional. This procession in academic scarlet and civic robes of many colours filed into the church, and at noon Their Majesties entered in their turn.

The commemoration service was preceded by four episodes, directed by Mr. Robert Atkins, dated 1546, 1123, 1946, and 1546. In the first a lay brother, one of the last representatives of the destroyed monastery, bewails its decay and calls on the spirit of Rahere to save his hospital. King Henry then enters with Queen Katherine Parr and petulantly complains of the crying of a sick child outside the church. The Queen tries to persuade him that perhaps he has not done quite right in depriving the people of London of their hospital, but the King goes out without promising any redress. The second episode goes back to 1123 with Rahere the Jester in Rome, turned priest and penitent by fear of death and promising to perform good works if he recovers. To him appears a vision of St. Bartholomew himself, standing in an arch of the triforium and telling Rahere what he must do. In the third episode a British R.A.F. pilot and an American officer of 1946 are looking round the church and recalling how it has almost miraculously

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survived the dangers of the years of war. They pause in front of the tomb of Rahere, who appears to them, and tells them of its foundation and how St. Bartholomew himself had promised that it should be protected by his wings. The fourth episode returns to 1546 with King Henry, now himself a very sick man, eager to restore the hospital by granting a royal charter, though he cannot bear to listen to the tedious reading of its terms by the clerk. He finally signs it and staggers out, soon to die, the accomplishment of the refoundation being signalised by a fanfare of trumpets echoing through the Norman arches of the most splendid choir in London.

In bald recital the brief pageant may sound too slight to be distinguished; but it was in fact a beautiful and moving spectacle. King Henry was finely represented by Mr. Robert Morley, the Queen by Miss Viola Lyel, Rahere by Mr. John Byron, and St. Bartholomew by Sir Lewis Casson.

The episodes were followed by a short commemoration service, which included an address by the Very Rev. Garfield Williams, M.B., dean of Manchester, who was himself a student of the hospital. Dr. Williams made many interesting observations on the part likely to have been played by Thomas Vicary, the King's surgeon, in the refoundation, and the reasons which may have influenced the King in undertaking it. Prayers were offered by the hospitaller, the Rev. D. F. Donne, by Canon E. S. Savage, and by the rector of the Priory Church, the Rev. N. E. Wallbank. The musical programme was directed by the organist of the church, Nicholas Choveaux.

At the end of the service the company dispersed; but the hospital had not concluded its celebrations. It was commemorating also the 600th anniversary of View Day, when the whole hospital is thrown open to visitors, the 150th anniversary of the foundation of the Abernethian Society, the 100th anniversary of the introduction of chloroform into the hospital, the jubilee of the use of X rays in the hospital, and the first anniversary of victory in Europe. During the afternoon hundreds of friends and old students of the hospital visited the wards and departments, which have mostly survived the destruction of the war years, and enjoyed an exhibition in the college library of some of the hospital treasures, including King Henry's charter bearing his signature, and dated 1546, a deed witnessed by Rahere in 1137, and the celebrated cartulary written by brother John Cok in the reign of Henry VI. There was also an exhibition of books and documents connected with John Abernethy, including a lovely miniature portrait lent by the Royal College of Surgeons, and "side shows" illustrating the history of anæsthesia and X rays.

It had not been possible to clear away all the dirt and rubble accumulated during the war years, but it was evident that the Ancient and Royal Hospital is again raising its head after its years of service as a casualty-clearing station. The only regret was that the moving spirit of the whole occasion, Mr. McAdam Eccles, was himself lying ill in the wards of the hospital and was unable to take part in the proceedings.

THE WORLD'S FOOD

THE April issue of the *Nutrition Bulletin*[1] analyses the world food situation. It says that Russia has expanded her grain production in the areas that were not occupied, but the last harvest in the liberated areas amounted at best to 80% of the pre-war average. There has been a serious shortage of tractors and draught animals, as well as fertilisers of animal origin. Russia is transferring 1½–2 million tons of grain to Poland, the Danubian countries, and France. Britain, which is not a food-exporting country, has surrendered only a few thousand tons of potatoes; the 900,000 tons of food sent to the Continent in 1945 was stock from overseas that was built up here for the purpose of relief.

The two main factors that have produced the world food shortage are war destruction and drought, but the position has been further complicated by floods in China, New Zealand, and Queensland. Apart from these unpredictable adversities, however, we have failed to estimate the probable yields and the probable demand for grain. Estimates of stocks had to be drastically revised downwards at the end of last year; the error seems to have been due partly to miscalculation of the amount of wheat likely to be fed to livestock in the North American countries, and partly to weakness in the statistical methods. No serious measures were taken to replenish the reserves of grain, which were rapidly diminishing throughout 1945. In Britain the policy of ploughing up the land was reversed, more grain was fed to stock, and the extraction of flour was lowered from 85% to 80%. In the great wheat-producing countries the acreage under wheat was about 16% below what it had been in 1938. Governments and farmers in these countries hastened to reduce their large reserves, which they considered might be unmarketable after the end of hostilities; much was either fed to stock or converted into commercial alcohol for the manufacture of rubber; and in the Argentine a large amount was used for fuel. We are paying today for the restrictionist farming policy which was accepted by all the main producing countries before the war. The only possible solution would have been the establishment, after the Hot Springs conference of 1943, of a supreme inter-allied council to decide the programme of food-production. As it was, the Combined Food Board in Washington continued to represent only Britain, Canada, and the U.S.A. At no time did UNRRA have any decisive voice in cropping and production programmes or in allocation. The new International Food and Agriculture Organisation was not in existence at the end of the war, and control passed virtually into the hands of Canada and the U.S.A.; since September last, probably three-quarters or more of the exportable surplus of wheat has lain in the North American continent.

The U.S.A. is endeavouring to conserve grain, and to apply to relief all that is available. The next three months will be among the most difficult in the world's history; after that everything will depend on the harvest. An attempt to pass on the blame from one country to another would be fatal. We must accept the warning that the food economy of the world is now so far integrated that it must be studied as a single problem in production and distribution.

AN INTERNATIONAL PHARMACOPŒIA

THE healing art of Hippocrates may recognise no distinction of race or nationality, but the reluctance of civilised man to depart from medieval standards of sovereignty still denies the world an international pharmacopœia. It is over eighty years since the feasibility of compiling such a work was first discussed at the International Congress of Pharmacy; but it was not until 1902 that a conference called by various interested governments was convened at Brussels. This conference drew up the "First International Agreement for the Unification of the Formulæ of Potent Drugs," which was signed by the representatives of 18 countries and was finally ratified in 1906. A second international agreement was drawn up at a conference in Brussels in 1925 and was signed by the representatives of 26 countries; but only 15 governments ratified it, and of these 10 did so with reservations. Among the 41 articles was one designed to provide for an international organisation, under the ægis of the League of Nations, for the unification of pharmacopœias. In 1937 the Health Organisation of the League set up a Technical Commission of Pharmacopœial Experts under

1. From the Children's Nutrition Council, 6, East Common, Harpenden, Herts.

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the chairmanship of Dr. C. H. Hampshire, secretary of the British Pharmacopœia Commission. This commission had just got well under way when war broke out in 1939, but as a result of commendable initiative by the British and American representatives, some of the work planned by the commission has been carried out, and the results are recorded in an interim report which has just been published.[1] The principal contents of this report are: (1) a list of drugs giving the usual and the maximum dose, as well as the method of administration; (2) a series of monographs dealing with some of the commoner drugs in use; and (3) an additional list of drugs under study for inclusion in an international pharmacopœia.

Here at last is a definite step in the right direction. The question now is, how much further are we and our fellow practitioners in other countries prepared to go? Ten years ago, in the preface to the first addendum to the *British Pharmacopœia*, 1932, the commission, after drawing attention to the value of coöperation with the Committee of Revision of the *United States Pharmacopœia*, expressed the hope that "this practice, having been once begun, may be continued with advantage to both books." Now that the war is over and UNO is getting into its stride (albeit rather painfully), it is to be hoped that this coöperation between ourselves and the United States will be rapidly expanded to include other countries, and that the Technical Commission of Pharmacopœial Experts, reinforced by representatives of other countries, will be enabled to take up the work from the stage reached by the interim report. The increasing potency of modern therapeutic preparations makes more than ever essential an internationally recognised (and observed) standard of preparation, potency, and dosage.

CARE OF CHILDREN

THOUGH the nation shows a growing regard for children, there are still many ways in which, without invading the parents' province, we might improve our care of them. Rosalind Chambers and Christine Cockburn [2] give a brief factual account of the provisions now made for children in England and Wales, and draw attention to the gaps. As Margery Fry points out in the foreword, too many local-authority services for children are optional, and too many agencies for child welfare are financially starved or served by overworked staff; and it will be too late in twenty years' time to repair the results of our shortcomings today. War measures brought the chance of better nourishment to many mothers and children, but not all mothers have used their opportunities. Thus the "take-up" figures for vitamin supplements for the year ending March 31, 1944, were: fruit juices 54%, cod-liver oil 26%, and preparations of vitamin A and D 43%. During the following year, these figures fell to 42, 21, and 37%. P.E.P., in a broadsheet on child health and nutrition,[3] attribute these unsatisfactory figures partly to distribution difficulties, as well as to lack of knowledge among the mothers. Troublesome waiting or queueing at local food offices or welfare centres deters many who are busy with other home duties; greater variety of vitamin-D products might encourage mothers whose children reject cod-liver oil; but in the long run more fresh fruit and a better understanding of food values by the general population are the things to aim at, provided these are coupled with adequate purchasing power. P.E.P. regard the National Milk Scheme of 1940 as possibly the greatest single measure for child health ever introduced into this country, and think that the special food services for mothers and children should remain part of the national food policy. There seem to be good hopes that this will be so. Milk and school meals will ultimately be free to all children, the free milk service coming into force with the family allowance scheme in August. Free school meals, however, will be introduced only when there are canteens to provide them—a consummation still remote. Not only do we lack accommodation, but skilled kitchen-workers are scarce, and the wholehearted coöperation of teachers cannot be expected while supervision of school meals means another task for people who are already doing too much. Better feeding of children thus turns on better staffing of schools. Yet it is encouraging to realise that nearly a third of elementary-school children, and just over half of those attending secondary schools, were getting school meals by June, 1944. Before the war only 3% of elementary-school children were taking them.

Chambers and Cockburn note many other lacunæ in our services—lack of beds for confinement, poor safeguards for the child who is sent to a foster home, inadequate inspection of homes and orphanages, too little inquiry into the fitness of would-be adopters of children, scanty welfare provision for the child between 2 and 5, no continuity of medical treatment for the school child, poor arrangements for children's holidays, lack of hostels for children with behaviour problems, mismanagement of delinquents, lack of psychological treatment in approved schools, too few play centres and other facilities for recreation, and poor safeguards for children working in shops and offices.

The chief need, in P.E.P.'s view, is to bring the various parties responsible for the child—the welfare clinic, the school health service, the family doctor—into a team, so that though a child may not be entirely in the care of one doctor, yet he will receive continuous care by a group of colleagues, rather than patchwork attention from various people who may not all be on the best of terms. The health centre, they suggest, is the place where the local-authority medical officers and the family doctor will be able to work together, sharing the services of the health visitor, and using a common system of records. In this way the centre would become the local focus for health supervision of young children and, working with the hospitals, for treatment of sick children of all ages. School and nursery school will be the place for medical supervision of children from the age of 2 onwards, and the children's unit or children's hospital, relieved of much minor medical work, will be a consultant and specialist centre, besides providing beds for those who need them. The maternity hospital will have an infants' department and premature-baby unit, and the special hospitals will cater for various types of maladjusted, defective, or invalid children. If these services work together, as P.E.P. picture them doing, it will be possible to keep complete and continuous records for each child, which will provide the data on which development of child-health services can be based.

MYASTHENIA GRAVIS AND THE THYMUS

THE operation of removing the thymus to relieve the symptoms of myasthenia gravis was introduced in the United States in 1941.[1] The first extensive series was reported a year later in this country by Keynes and Carson [2]; of 12 patients submitted to operation, 3 died and 7 were completely, or almost completely, relieved of symptoms. The hope expressed at that time—that this surgical experiment was the beginning of a real advance—has now been largely fulfilled, as is evident from the report, on another page, of a recent meeting of the Royal Society of Medicine. In the series described the decline of mortality associated with operation may

1. *The Unification of Pharmacopœias.* Interim Report of the Technical Commission of Pharmacopœial Experts. (*Bull. Hlth Org. L.o.N.* 1945–46, **12**, extract 4.)
2. The Nation's Children. British Association for Labour Legislation, 21 Clareville Grove, London, S.W.7. Pp. 39. 9*d*.
3. Planning. April 18, 1946, no. 248.

1. Blalock, A., Harvey, A. M., Ford, F. R., Lilienthal, J. L. jun. *J. Amer. med. Ass.* 1941, **117**, 1529.
2. See *Lancet*, 1942, ii, 673.

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be attributed to further experience in managing the stormy postoperative period and to the skill of Keynes, though he modestly described himself as a carpenter carrying out the physicians' directions. Dr. Purdon Martin made it clear that the operation can be received with only qualified approval. But it is equally evident that until the biochemical changes in myasthenia gravis can be controlled by other methods it will continue to help sufferers otherwise doomed to a miserable lingering existence and a probable early death.

NEW TOWNS FOR OLD SLUMS

"In all the great new towns of the Midlands and the Industrial North large housing estates sprang up on which, by the exercise of remarkable forethought and ingenuity, so great was the anxiety lest the worker should be too far removed from the sights and sounds of the factory or mine which was the scene of his cheerful labour, a quite fantastic number of working families were accommodated. In order that the inhabitants might have the privilege of contemplating, almost ceaselessly, the visible tokens of nineteenth century man's final triumph over nature, many of these estates were carefully built alongside the permanent way, or even, if there was a viaduct handy, actually underneath it. . . . These working-class residential districts met with the complete approbation of landlords and employers alike and it was only at the very end of the century that the voices of certain muddle-headed philanthropists were heard declaring that such houses and streets were unfit for human habitation. The best answer to such officious and inexperienced busybodies is provided by the fact that today, after a lapse of nearly a century, a large proportion of the population still live in them."[1]

THE New Towns Bill is an earnest of the nation's wish to empty those black estates and build more honourably. But in dispersing the inhabitants we must distribute their homes round appropriate centres of employment, and avoid the further growth of the straggling suburbs which in the last thirty years have depressed the spirits of all but their builders. The Minister of Town and Country Planning has based his Bill on the two interim reports of the Reith Committee,[2] and has followed all their main recommendations. The development of the new towns is to be placed in the hands of public corporations, appointed by the Minister, one for each town. If the Minister, after consulting the local authorities concerned, decides that an area should be developed as a town he may make an order dedicating that land to the purpose. The area may include an existing small town which will form a nucleus. The corporation will have powers of compulsory purchase to acquire the site; but where land belongs to a local authority or to the National Trust special Parliamentary procedure will be necessary before the corporation can acquire the land. Outlay will be met by the Government through a consolidated fund, and the corporations will not have power to borrow money otherwise than through the Exchequer. Each new town is to be built as quickly as possible to receive a population of 15,000–20,000; and after that it may be developed up to but not beyond its intended limit, and the area must be large enough to allow for a green belt.

Each corporation will consist of a chairman, a deputy chairman, and up to seven other members, appointed by the Minister after consultation with the local authorities concerned; and its establishment will not affect the powers and duties of the local authorities. When the work of development is complete, some 10 or 12 years after the end of the war, the corporation will hand over to the local authority. This uniform type of corporation was criticised at the second reading of the Bill. The parliamentary reception of the Bill was otherwise largely favourable, reflecting the public determination to have done with delays in this important work. The *Times* of May 9 reminds Mr. Silkin that he cannot get very far in replanning town life without strengthening the Distribution of Industry Act. This was a point which the Reith Committee had in mind; they do not think it will be possible to synchronise perfectly the movement of employing firms with the movement of employed people; and so for a time the new towns may be simply dormitory towns. The corporation in that case must ensure proper transport for the workers to their work. But, as the committee point out, "a semi-dormitory which becomes self-contained is better than a suburb which is a dormitory for all time."

1. Osbert Lancaster in *Pillar to Post*.
2. Interim Report and Second Interim Report of the New Towns Committee. H.M. Stationery Office. 4*d*. and 6*d*. respectively.

THE INSOMNIA OF HEART FAILURE

THE therapeutic value of a good night's sleep is nowhere more evident that in patients with heart failure; yet these people are often peculiarly resistant to soporific drugs. Wheeler and White[1] suggest a possible reason for this. In their view insomnia may be the presenting symptom of left ventricular failure, and in patients with hypertension, aortic stenosis, aortic incompetence, and extensive myocardial infarction the cause of the insomnia may be pulmonary congestion, even though no basal crepitations are present. Inquiry usually reveals that these patients have dyspnœa on exertion and that though they do not complain of nocturnal dyspnœa, they are more comfortable sitting up than lying down. Even in cases where the diagnosis of left ventricular failure is obvious, it is not always realised that the sleeplessness is due to this orthopnœa, and vain attempts are made to control it with hypnotics. Ultimately sleep may improve because of the onset of right ventricular failure which temporarily relieves the pulmonary congestion, but by this time the patient is likely to be beyond the reach of any form of treatment. On the other hand, if the cause of the insomnia is appreciated in the early stages there is a good prospect of bringing relief to the failing myocardium by rest and the administration of digitalis, or, if the condition has progressed too far to respond to these measures, by a course of organic mercurial diuretics with a low-salt diet. Moreover, by reducing the pulmonary congestion, this treatment will relieve the insomnia.

MEDICAL FILMS

VOLUNTARY coördination in the production of medical films is proposed by the medical committee of the Scientific Film Association. An intending producer may obtain from the hon. secretary a list of films on the subject in which he is interested, and, if possible, a viewing will be arranged. It is suggested that producers should confidentially inform the hon. secretary of subjects that are to be filmed, to avoid overlapping by the simultaneous production of more than one film study on a single subject. Offers of coöperation should be sent to the committee's hon. secretary, c/o the Royal Society of Medicine, 1, Wimpole Street, London, W.1. The committee has now published its fourth hand-list of medical films, most of which have been issued within the last twelve months.

Surgeon Rear-Admiral Sir Gordon Gordon-Taylor has left for America, where he is to occupy the chair of surgery at Harvard University for a complimentary period at the invitation of the professor, General Elliot Cutler.

AMONG those elected on May 9 to the foreign membership of the Royal Society was Dr. Herbert Spencer Gasser, director of the Rockefeller Institute for Medical Research in New York.

1. Wheeler, E. O., White, P. D. *J. Amer. med. Ass.* 1945, **129**, 1158.

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Reconstruction

REMUNERATION OF THE GENERAL PRACTITIONER *

IN February last year a committee was appointed to consider what ought to be the range of total professional income of general practitioners in any publicly organised service. The chairman was Sir Will Spens (formerly vice-chancellor of Cambridge University); the eight other members included Dr. J. A. Brown (chairman of the Panel Conference), Dr. O. C. Carter (Bournemouth), Dr. W. M. Knox (Glasgow), and Dr. S. A. Winstanley (Urmston, Lancs); and Dr. Violet Kelynack (B.M.A.) was one of the secretaries.

The committee was asked to pay due regard to what have been the normal financial expectations of general medical practice in the past, and its information on this subject is drawn from a report (prepared for the British Medical Association by Prof. A. Bradford Hill, D.SC.) on the incomes of practitioners in 1936, 1937, and 1938. This information was obtained by analysing the answers sent by 3008 doctors in response to a questionary addressed to a random sample of 4888, and, as Professor Bradford Hill points out, the final sample may not be representative of all those approached; but the committee thinks that it is "sufficiently accurate for our purpose," being unlikely to involve more than a 10% error in the mean incomes revealed.

Table A shows the distribution of net incomes of practitioners of various age-groups in urban areas in 1936–38. (The net income is the sum left after deducting the professional expenses allowed for purposes of income-tax.)

TABLE A—NET INCOMES IN URBAN AREAS, 1936–38

Ages ..	30–34	35–39	40–49	50–54	55–59	60–64
	%	%	%	%	%	%
Under £700 p.a.	22·0	16·5	20·0	17·5	30·0	33·5
£700–£1000 ..	35·0	25·0	22·5	23·5	22·0	26·5
£1000–£1300 ..	23·0	23·0	21·0	22·0	19·0	15·5
£1300–£1600 ..	10·0	20·0	17·5	15·0	12·5	15·0
£1600–£2000 ..	7·0	10·0	10·0	10·0	11·5	6·0
£2000–£2500 ..	2·0	4·0	5·5	7·5	2·5	3·5
Over £2500 ..	1·0	1·5	3·5	4·5	2·5	—

It will be seen that between the ages of 40 and 55—i.e., throughout the best years of a general practitioner's working life—almost 20% of urban practitioners had a net income below £700 a year, and over 40% had a net income below £1000.

"Having regard to length of training, to the arduousness of the general practitioner's life compared with that in other professions, to the greater danger to health, to the skill and other qualities required and to the degree of individual responsibility, we are unanimous in holding that the percentages of low incomes are too high. Having regard to the same facts, we are clear also that the proportion of practitioners able to reach a net income of £1300 or over is too low. We consider that unless conditions are substantially improved in both these respects, and on the basis of a pre-war value of money, the social and economic status and the recruitment of general medical practice could not, in the long run, be maintained.

"We believe that this would be so even apart from proposals for a publicly organised general medical service. There is, however, one particular factor involved in comprehensive proposals for such a service which is calculated to have very grave repercussions on recruitment to general practice unless the financial expectations in that field of practice are improved. In the past, many young doctors have been deterred from becoming specialists by the considerable risks and by the practical certainty of a number of lean years if they attempted to do so. In a comprehensive public service it is inevitable and right that the risks and lean years will present a less formidable deterrent. A much increased menace to the recruitment of general practitioners in the future will lie, in our judgment, in the competition of other branches of medicine than general practice. We, and not least our lay members, consider that it would be disastrous to the profession and to the public if general practice were recruited only from the less able young doctors. We consider, however, that unless the financial expectations in general practice are substantially improved the great majority of the abler men will seek to become specialists, in view of the fact that as specialists they have an equal outlet for their interests in medicine, can more easily keep close contact with hospitals and with medical progress and will have a less arduous life.

"There is a further factor to which we attach considerable importance. The help, support and comfort which a doctor can give to his patients must, in our judgment, be seriously affected if a doctor is himself seriously worried. We have no doubt that low incomes have, in fact, been a source of grave worry to many general practitioners and must have prejudiced their efficiency."

WHAT IMPROVEMENT IS DESIRABLE?

The committee did not think itself qualified to say what adjustment of pre-war incomes is necessary to produce corresponding incomes today. Its recommendations therefore are entirely in terms of pre-war money. The report is to be read as if it were produced in 1939, and the committee leaves to others the task of translating its 1939 figures into their present equivalent.

After long discussion it decided in favour of securing an alteration in the spread of incomes not less favourable than is shown in table B.

TABLE B—DISTRIBUTION OF NET INCOMES IN AGE-GROUP 40–49

	Proposed Distribution (%)	*Distribution before 1939* (%)
Under £700	7 ..	20
£700–£1000	20 ..	22·5
£1000–£1300	24 ..	21
£1300–£1600	24 ..	17·5
£1600–£2000	16 ..	10
Over £2000	9 ..	9

"The effect of this proposed distribution is, as will be seen, to reduce from 20% to 7% the proportion of incomes under £700; to reduce from 42·5% to 27% the proportion of incomes under £1000; and to increase from 36·5% to 49% the proportion of incomes over £1300. We do not think it necessary to recommend an increase in the proportion of incomes of or over £2000 but we consider that this proportion ought to be maintained and that it should be possible for practitioners of exceptional skill and ability to reach a net income of at least £2500.

"The effect of our proposals can be put very simply by saying that between 40 and 50 years of age approximately three-quarters of general practitioners ought to have achieved a net income of over £1000 per annum, approximately half ought to have achieved a net income of over £1300 per annum, approximately a quarter ought to have achieved a net income of over £1600 per annum and slightly less than 10% a net income of £2000 or over."

The committee next considered what ought to be the position in regard to lower and higher age ranges, and concluded that in the age-groups both above and below 40–49 ("even between 30 and 35") doctors ought to receive substantially the same remuneration for the same burden of practice.

"It appeared to us undesirable that men should be less well remunerated merely on grounds of age, save perhaps to a very limited extent, when they were carrying the same responsibilities and feeling the same discomforts of full and heavy practices. Further, a good chance of achieving success, and of receiving a corresponding

* Report of the Interdepartmental Committee on Remuneration of General Practitioners. Cmd. 6810. H.M. Stationery Office. Pp. 31. 6d.

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income, at an early age is likely to weigh heavily in favour of general as against specialist practice, and thus to provide a balance . . . to the attractions of the latter."

The committee then tried to ascertain how much the incomes of practitioners in 1939 would have had to be augmented in order to secure the kind of distribution it thought desirable. Seeking a formula, it found that if all incomes under £1200 had been augmented by £200, and all incomes of £1200–2000 by a quarter of the difference between that particular income and £2000, the distribution would have been as shown in table C. It will be noted that for age-groups 40–49 this agrees roughly with the distribution proposed in table B.

TABLE C—DISTRIBUTION OF INCOMES IF 1939 INCOMES HAD BEEN AUGMENTED ACCORDING TO THE COMMITTEE'S FORMULA

Ages ..	30–34	35–39	40–49	50–54	55–59	60–64
	%	%	%	%	%	%
Under £700 p.a.	10·5	6·6	8·0	7·2	20·4	17·4
£700–£1000 ..	22·3	16·6	19·1	17·3	15·8	23·2
£1000–£1300 ..	35·0	26·6	23·4	24·8	21·9	27·5
£1300–£1600 ..	17·8	26·9	23·7	23·7	21·5	17·9
£1600–£2000 ..	11·6	17·7	16·7	14·9	15·4	10·6
Over £2000 ..	2·7	5·6	9·1	12·0	5·0	3·4

WHAT MIGHT BE DONE

The committee's next task was to consider how far and in what circumstances such a spread of incomes as it had in mind could be realised. While explaining that it is directly concerned only with the remuneration a practitioner should receive and not with the method or basis of his payment, it points out that the two problems cannot be entirely separated.

"We are satisfied that there is a far greater diversity of ability and effort among general practitioners than admits of remuneration by some single scale applicable to all. If the recruitment and status of the profession are to be maintained men must be able to feel that more than ordinary ability and effort receive an adequate reward. On the other hand, a reward which would be appropriate when these exist would be extravagant when they do not. In consequence, we are clear that any satisfactory system of remuneration must involve differentiation dependent on ability and effort. Further, if the profession is to be satisfied and recruitment maintained, it is essential that the method of differentiation should command confidence. We are satisfied by the evidence put before us that no existing degree or qualification can wisely be made the basis of additional payment, largely because many of the qualities which make the best general practitioner are, in fact, unexaminable."

The committee expresses no opinion on the question whether a practitioner should be paid wholly or partly by capitation fees or by a method which takes capitation fees into account. It received evidence that payment by capitation is acceptable to a majority of the profession; but "other methods . . . may prove acceptable or may be preferred for other reasons," and "while we assume in the discussion which follows that incomes are dependent at least to a substantial extent on the number of patients for whom a practitioner is responsible, we do so merely because this is a possible method, and the most obvious method, of securing such variations of income as are necessary if different degrees of ability, effort and resulting work are to be suitably remunerated."

How then could the committee's proposals for a better distribution of incomes be realised if the practitioner were paid largely in capitation fees? If the great majority of doctors had each a number of patients not far from the average, there would obviously be no such differentiation of incomes as is shown in tables B and C: while it would be easy for example to arrange that 50% had less than £1300 a year and 50% had more, it would be harder to ensure simultaneously that only about 25% had less than £1000, about 25% more than £1600, and nearly 10% over £2000.

"Difficulty is most likely to arise over the highest and lowest income ranges. So far as the latter are concerned the difficulty could be met if practitioners received or could qualify for some augmentation of income which was independent of capitation. We anticipate that the general introduction of a publicly organised service would of itself level up low incomes to a considerable extent. In consequence any augmentation required would be likely to be small, and such as might be provided, for example, if sufficient refresher courses could be made available by paying a bonus of, say, £100 a year to a practitioner who had attended such a course within the preceding three years, or even by making a grant towards professional expenses when, as is the case with the lowest incomes, they represent an abnormally high percentage of gross receipts. We stress this point so as to make clear that the question whether a substantial part of a practitioner's income should take the form of a fixed salary or retaining fee is not involved and remains to be decided on general ground of policy.

"Where we expect most difficulty to arise is in regard to securing the percentage which we think desirable of practitioners with net incomes over £2000 and the possibility of incomes of not less than, say, £2500. As has been said we do not think it necessary in order to maintain the recruitment and status of general practice that the percentage of incomes over £2000 should be increased, but we think that it is certainly necessary that this percentage should be maintained and, also, that there should continue to be a real possibility of obtaining in a small proportion of cases incomes considerably over £2000. The difficulty is likely to arise owing to the fact that no practitioner can assume responsibility for more than a certain number of patients and because this number may well not be sufficiently large to provide high incomes in the absence of a considerable amount of private practice."

To get over this obstacle the committee proposes that any practitioner should be free to engage an assistant, and that some 10% of them, selected on grounds of success in practice and general suitability, should be encouraged to do so.

"We suggest in the first place that such a practitioner should receive as part of his remuneration in a publicly organised service a supervision fee of £100 per annum in respect of an assistant who had no previous experience or only one year's previous experience of general practice. We suggest that such an assistant should receive £500 in his first year, and £600 in a second year if any. Since these salaries and additional professional expenses, say, £250, will have to be met by the principal and since it would take time to enlarge a practice to the extent which would cover this expenditure, we suggest that a practitioner who has been approved for this purpose *and who has not previously had an assistant* should receive, in addition to the £100 supervision fee, say, £500 in the first year, £300 in the second year and £100 in the third year in which he had assistants of the type in question. We believe that some such system would improve training, would enable the most successful practitioners to treat or supervise the treatment of considerably more patients, thus making their services more widely available, and would meet the difficulty we anticipate in securing that incomes substantially over £2000 will continue to be obtainable in general practice."

The committee recommends that after completing house-appointments the doctor wishing to enter general practice should spend a year, or preferably two years, as an assistant, receiving a net salary of not less than £500. It has little doubt that even those intending to become specialists would benefit by spending a year in this way.

Though it feels that a single salary scale, applicable to all, would be inappropriate for general practice, it points to the advantage, "even in a profession which in an

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unusually high degree is also a vocation," of enabling the potential entrant to gauge his financial prospects. Short of a salary scale, he would be helped by knowing that certain specified percentages of practitioners reach between, say, 40 and 50 years of age, certain levels of income.

RURAL AREAS AND HEALTH RESORTS

Mixed practices have produced somewhat higher incomes than urban ones, but it is doubtful whether this difference would persist in a publicly organised service. More serious is the difference between average remuneration in urban and rural practice.

"... we consider that the differences of approximately £200 which existed in 1939 between incomes about the £1000 level in the two classes is excessive and requires reduction by about half, when regard is had to all the facts involved. It appears probable that this could best be secured by weighting mileage more heavily.

"We wish to add that we are convinced that it will be necessary to extend to certain other sparsely populated areas the system adopted in the Highlands and Islands Scheme and we cannot regard as adequate even in 1939 the remuneration under that scheme. We consider also, not only or even particularly in regard to rural areas, that it may be necessary to supplement incomes in respect of areas which are so unattractive as not to draw to them an adequate supply of doctors."

For health resorts in which old persons and invalids tend to congregate some special provision will be desirable, either by a general weighting of capitation fees in the case of the aged and chronic sick, or by a contribution from a central to a local pool.

THE COST

Assuming that the number of people covered by the service is 45 million, the committee believes that its proposals could be realised at a cost of 15*s*. 6*d*. a head, of which 6*d*. would cover special expenditure and 15*s*. the normal remuneration of practitioners. As its figures represent a "very considerable increase both on capitation payments under the existing National Health Insurance Scheme and on the total net income of practitioners in the three years ending in 1939," the committee explains its reasons for recommending this increase. The first is that the N.H.I. capitation payments appear to have been inadequate. Secondly, even apart from the introduction of a publicly organised service, "we do not believe that a profession involving the arduous life and heavy responsibilities of general practice could permanently maintain its recruitment in present conditions, either as against other professions or as against other branches of the medical profession, with so high a proportion of low incomes in middle age as the payments before 1939 in fact produced." Thirdly, through the introduction of a new service "doctors will have to do yet more work," and general practice must be made attractive enough to prevent all the abler men trying to become specialists. "General practice is the foundation on which all else is built. If its recruitment is not maintained—alike in quantity and quality—both as against other professions and as against other branches of the medical profession, no other health service, specialist or hospital service, however excellent, can make good the loss or even play successfully the part it should play."

RECOMMENDATIONS

It should be noted that the following recommendations by the committee are expressed in terms of the 1939 value of money:

(1) A scheme should be devised which will ensure that between 40 and 50 years of age approximately 50% of general practitioners receive net incomes of £1300 or over, and which will also secure, so far as practicable, that between 40 and 50 years of age approximately three-quarters receive net incomes over £1000, that approximately one-quarter receive net incomes over £1600, that slightly less than 10% receive net incomes over £2000, and that, in a small proportion of cases, it is possible to obtain net incomes of at least £2500. (This proposal is approximately equivalent to the augmentation of net incomes in 1939 by £200 in the case of incomes between £400 and £1200 and, in the case of incomes over £1200, by £200 at £1200, diminishing progressively to nothing at £2000.)

(2) Before 40 and after 50, practitioners should be remunerated at the rate applicable between 40 and 50 to the burden and responsibilities of practice which they are in fact carrying.

(3) In securing the above results, a method of differentiation of income should be chosen which will command so far as possible the confidence of the profession.

(4) The difference which has existed between the incomes of rural and urban practitioners should be reduced; the Highlands and Islands Scheme should be applied to other sparsely populated areas, and the remuneration under that scheme should be increased.

(5) Additional remuneration should be given in areas which prove so unattractive as not to draw an adequate supply of practitioners.

(6) An adjustment in the method of payment in so far as this depends on capitation should be made in the case of practices involving an altogether abnormal number of aged persons and chronic invalids.

(7) On completion of resident hospital appointments a recently qualified practitioner should secure an initial net income of not less than £500 per annum as an assistant to a doctor in general practice.

RIDER TO THE REPORT

The committee's report is signed by all the members except Sir Ernest Fass, formerly a Public Trustee, who dissociates himself from recommendations 1 and 2. In a rider he points out that the range of remuneration must be such as will attract to, and retain in, the National Health Service a sufficient number of men and women of the capacity required for its work; but "there is no evidence that the financial reward played any large part in the choice of medicine as a career, or that the financial prospects which are disclosed in Professor Bradford Hill's tables were a deterrent to entry into the profession in the pre-war years. There was in those years no decline in the number of entrants to the schools, though five out of twenty-three Deans report a falling off in quality."

Among the factors that should be taken into account in settling a scale of remuneration for general practitioners is "the financial return in other comparable professions, a matter which is not discussed in the report. ... I see in the establishment of a publicly organised general practitioner service no cause for varying the relativities either between the professions or within the medical profession itself." He suggests a comparison between the position of a general practitioner and that of a doctor employed whole-time in a local-authority hospital, and the range of remuneration which he recommends is based partly on the scales adopted last

TABLE D—SIR ERNEST FASS'S PROPOSALS FOR DISTRIBUTION OF INCOME

	1946 (%)	*1939* (%)
£500 at entry rising to £700 after 3 years and then to £1200 ..	50·0	64·15
*£1200–£1800	30·0	26·09
*£1800–£2200	12·5	5·69
£2200–£2500	5·0	2·00
£2500–£3000	2·5	2·07

* These are the Middlesex county hospital scales for "senior clinicians" and "senior clinicians on proof of outstanding achievement" respectively.

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November for Middlesex county hospitals. His recommendations (table D) are for net earnings and (unlike the figures in the report) for 1946. The 1939 percentages are taken from Professor Bradford Hill's tables and are for all ages.

Sir Ernest concludes by saying that "there should be opportunity for every doctor to reach £1200 by the age of 40 and nothing to prevent him reaching the higher ranges before that age."

Special Articles

ROYAL COLLEGE OF SURGEONS
NATIONAL HEALTH SERVICE

AT a meeting of fellows on May 8, Sir ALFRED WEBB-JOHNSON, the president, reported resolutions by the council of the college on the National Health Service Bill. The council, he said, concurs with the observations of the Negotiating Committee on the proposed service and gives the committee its full support. It also makes the following observations:

(*a*) The Negotiating Committee is urged to press for the direct and independent representation of the medical profession on whatever statutory bodies may be set up to administer the service.

(*b*) The council reaffirms its opinion (recorded on Feb. 27) that "State ownership of the hospitals is in no way essential to the successful administration of a National Health Service."

(*c*) While approving of the principle of unified control of hospitals other than teaching hospitals by regional boards of satisfactory composition, the council views with apprehension the appropriation of trust funds.

(*d*) The council does not agree that the power to retain existing endowments and accept funds should be confined to teaching hospitals.

(*e*) The institution of health centres should be experimental in the first instance.

(*f*) The council is opposed to the principle of a whole-time salaried service.

(*g*) The council agrees with the Negotiating Committee that "control" is unnecessary and undesirable in regard to the distribution of doctors. An adequate distribution can be effected without any change of system other than the offering of extra inducements in the case of unattractive districts.

(*h*) The present system of sale and purchase of the goodwill of general practices should not be interfered with; but if the sale of practices is made illegal or otherwise rendered ineffective, adequate compensation should be paid.

(*i*) The restrictions which it is proposed to place on the provision and use of private accommodation in hospitals are considered undesirable. Hospital services should be so planned as to provide for all classes of the community, and no regulations should be introduced which would discourage private patients from going to hospital for treatment, or discourage specialists from advising them to do so. In general, the fees payable by private patients should be fixed by the medical profession without interference by outside authorities, except that, when accommodation is provided at specially reduced rates for persons of moderate means, it is reasonable to lay down a maximum charge for professional services.

The PRESIDENT said that the whole scheme should be considered on its merits, and not as a political issue. The profession's task now was to obtain such amendments as were considered necessary.

Mr. T. B. LAYTON suggested that there had been too much opposition to the Bill as a whole; many of its terms had been foreseen for the last 30 years. Although some clauses might be disputed, two of the proposed reforms were undoubtedly timely: these were the withdrawal of domiciliary treatment from approved societies and the removal of hospitals from the local political system. Some of the issues on which the profession was criticising the Bill should, he considered, be debated and decided after the Bill was enacted: most of the points were not suitable for inclusion in an Act, where they would have a degree of permanence which would hamper subsequent amendment. It was wrong, he thought, to insist on the right to buy and sell practices; this custom was not seemly in the public's eyes, and in recent years displeasing aspects had developed, which would eventually have compelled the profession to take action.

The PRESIDENT agreed that the Bill was bold and statesmanlike; in particular, the institution of regional bodies which are to have full authority would be an important advance. But there were many points for adjustment.

Mr. WILFRID ADAMS suggested that national health should be safeguarded by a medical advisory committee. Is this Bill, he asked, emanating from leaders of the profession? He considered that the operation of the National Health Insurance Act and of the tuberculosis service indicated the Government's incapacity to organise the medical service; and he suggested that the profession should offer an alternative plan to that advanced in the Bill. The present Bill should be an interim measure; and the Government should be guided by the profession in deciding the form of the more revolutionary changes, the introduction of which should be deferred.

Mr. DICKSON WRIGHT defended the sale and purchase of practices, which, he said, was a guarantee of good faith by doctors. The effect of the Bill, he said, would be to foster not only utility hospitals but also utility doctors.

A motion by Mr. LAYTON that the council's resolutions and its action in supporting the Negotiating Committee should be approved was carried unanimously.

Medicine and the Law

Reinstatement

A MEDICAL officer was appointed to the staff of Whipps Cross Hospital in 1932, and in 1939 was drawing his maximum salary of £450 per annum. On August 31, 1939, he resigned to join the R.A.M.C., which he did on the following day. About a month before he was demobilised he wrote to the hospital concerning his return but he did not fill in a reinstatement form. He was informed that there was a vacancy for a temporary appointment at the hospital and on the advice of the medical superintendent he applied for and obtained this appointment which carried a salary of £350 a year. This was about a month before he was demobilised. In view of his previous service with the West Ham borough council he applied by letter for his previous salary and for his appointment to be permanent. He received the reply, however, that as he had resigned in 1939 and had withdrawn his superannuation contributions the council did not propose to take any action in the matter. He appealed against this decision and the matter was referred to the Reinstatement Committee. The committee, after hearing counsel representing the medical officer, made an order that the West Ham borough council was to make available for him employment at Whipps Cross Hospital from Sept. 1, 1945, at a salary of £450 a year, plus cost-of-living bonus, on terms not less favourable to him than those which would have been applicable to him had he not become a person to whom the Act applied.

The practitioner was assisted and represented by the London and Counties Medical Protection Society.

Sir Howard Florey, F.R.S., is visiting Paris and Lyons under the auspices of the British Council from May 18 to 25. He is to receive an honorary degree at Lyons, where he will lecture on penicillin and allied subjects.

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In England Now

A Running Commentary by Peripatetic Correspondents

"*Frozen!*" Was it unconscious irony when officialdom first coined this phrase? How apt it is—but one wonders whether they realise the cold, numb, frustrated despair which grips a man when he hears he is not to be released in his age and service group. Near madness clouds the mind: for five years and more one has been buoyed up with dreams of leaving it all behind; of rejoining one's wife and home. The calculated date stands ringed before one and crawls nearer hour by hour. There are but a few short days to go. Already preparations are under way at home—perhaps a celebration party of old friends, a job fixed up, appointments made—then, and not till then, cold icy officialdom strikes to "freeze."

The date that was ringed for joy now stares in empty mockery from a meaningless calendar. One wonders how to tell a wife without too great a hurt. One sees a long-worked-for job going to a rival of student days; the holiday of holidays planned and booked now cancelled—no wonder one is frozen, benumbed in mind and soul. Is this the brave new world where all is fair? Is this the reward for working to get "That little extra some others haven't got"?

Wild schemes of rebellion jostle through one's head, till finally one falls into an uneasy paranoic sleep, half glimpsing pre-views of the soulless bureaucratic Bevan-world to come.

* * *

We were very grateful for the steaming coffee which appeared in tin picnic cups on a tin tray, together with white rectangular sugar-lumps the like of which we hadn't seen since last in Cairo. And the coffee tasted good—unusual in local establishments. For more than an hour we had been sitting in the hall space at the end of a short corridor, between the street and the house proper. In addition to the through-and-through draught we were also subjected to a still more piercing down-draught from the bomb-damaged roof. Even in the half light our pale faces were clearly reflected in the glass-fronted show-cases on the opposite wall. The old lady who sat behind the counter was wiser. She was perhaps better acclimatised than we, but she wore a heavy winter coat, while we had removed our Burberrys and our hats on arrival, so warm were we after a brisk step which in the last stretch had tried our wind.

It was of the nature of a social visit—or so we imagined by now. We had introduced ourselves as serving with a captain whose name recalled girlhood memories. "Do I know him, Ser? I remember him as a lieutenant, and his father before him!" And she lapsed into reminiscences dating from the sunny days of Edwardian peace, names of commanders-in-Chief (Mediterranean) falling from her lips like so many "Hail Marys." As she leant back from a position of confidential whisper, the smoke from her cigarette framed poster-portraits of members of the senior service to whom we were introduced in turn. Truly we were with the great! And she herself is a great lady, known to three generations of fighting men by her christian name—Carmela. Years have dealt kindly with her. Her hair is silver, her health robust and apparently unaffected by the shortage of siege and the bombing. But from one eye her sight is forfeit. "I prayed, Ser. I prayed for four hours each day, and God spared us." "Yes, Mother." Her son and some grandchildren had joined us.

We scarcely dared to mention the purpose of our visit; but her son had just brought in some new "pieces." "These are verra fine, Ser." And we were at once privileged—Private View! Members' Day! Wrinkled fingers smoothed each piece against the black velvet with suitable descriptive incantation, and revealed in each a characteristic beauty. A few were fine, like spider's web against some dark pool, transformed to silver in the light of morning sun; others showed like daisy-heads on summer's lawn, or again as frost-patterns on winter's pane. We ignored the larger net-like varieties with emblem-cross emblazoned and those which in one word declared their origin. Carefully we chose the dainty and the pleasing, for our Christmas, or birthday, or home-coming presents.

But could we really offer to purchase? We were paying a call. Fine points of the art had been explained—indeed, we had seen uncovered, but a few minutes before, the very technique of the fabrication; the pinned-pattern, part-wrought, with all its peculiar pendant "pirns." Yet, still we felt that these objets d'art could scarcely be translated into pounds, shillings, and pence—or rather pounds and shillings, for war-time values here are such that only paper-money is seen. Reassurance came from the recollection of a remark by a lady-artist that while "acceptance" of her water-colours gave her satisfaction, the attached white labels bearing four red letters were what afforded true delight. Thus emboldened, we put together our selection, gently, one by one. . . . Quick hands almost seized our choice; an appraising eye searched the pattern. . . . "Yes, Ser, that iss good, verra good! Registered, Ser? I post them registered today? No? You take them! Verra fine work, Ser. What I say, just my war-time work, but verra best, Ser!"

We shall treasure those Maltese lace collars and handkerchiefs dearly.

* * *

A soft answer may turn away wrath; and so may an explanatory one. On a beautiful sunny afternoon I was at Lord's sitting behind a man with black hair, when I noticed that he had two symmetrical patches of grey hair where the great occipital nerves become cutaneous. At the end of the game I asked the man bluntly if I could have a photograph of the back of his head. After looking at me in blank astonishment he told me to go to the devil. Whereupon I told him I expected some such an answer and elaborated my scientific reasons for my question. After being assured that the grey patches were not indicative of dangerous bodily complications and that if I could give complete physiological and pathological reasons for their presence I would be F.R.S. tomorrow, he became a mollified accomplice and promised me a photograph if I paid the expenses. Eventually I got the photograph and paid the bill, but the photograph was blown to smithereens in a blitz. I would like to possess another photograph to see if any changes in pigmentation have occurred after all these years.

* * *

I am rather addicted to news-films—that is, I revel in the short coloured Disneys and Disneyoids which pass under that name—and since there is a news cinema half-way between the Royal Society of Medicine and the hospital where I do my outpatients I often indulge this taste. I am also rather an amateur of psycho-analysis, and it has gradually been borne in on me that these films exhibit phenomena which are of some analytical interest. Thus they are almost without exception about animals; this means that there need be no restrictions in portraying behaviour and motives, and the animal is a well-known symbol for the unconscious. Further, they have to be turned out with such frequency and regularity that the process of composition must have become by now one of pretty free association. So perhaps it is not surprising that they should recurrently portray some very basic features of the human mind.

Two points particularly occur to me. One is the common situation where Pluto is trying to rid himself of a fly-paper by frenzied efforts which only result in attaching it to another part of his anatomy, or Mickey is having similar troubles with a coiled spring or a mouse-trap. The other is where, having escaped (as he thinks) after a furious chase from some enormous pursuer such as a bear, the hero-animal finds himself sitting down unawares in the creature's lap or backing into him.

I leave all this to the professionals to interpret; they would find it an interesting field for research. But it does seem to be related to questions of compulsive and obsessive behaviour, such as the unsuccessful attempts we all make to lose unpleasant traits which are after all part of ourselves, and the unhappy regularity with which our more primitive emotional drives catch up with us and make nonsense of our higher aims.

* * *

When in one of his recent "Good Health" talks the Radio Doctor was extolling the value of fish as food, at one stage his professional interests overcame his gastronomic, so that caviar was distinctly described as the "roe of the surgeon." Would this be "chirurgiophagy"?

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Parliament

ON THE FLOOR OF THE HOUSE

LAST week Monday's sitting of the House ended at 12.24 A.M. on Tuesday, and Tuesday's sitting at 5.23 A.M. on Wednesday morning. This chapter of late sittings seems likely to be the rule rather than the exception and means that members will be as much judged by their physical powers of endurance as by their political knowledge and parliamentary skill.

The House meets now at 2.30 P.M. on the ordinary routine, and on the morning after these late sittings some members had to be present at Standing Committees at which the work of detailed discussion and amendment proceed.

This is serious enough in itself; but it may fall to the House to have to consider matters of great significance and vast importance when in this condition of fatigue, as happened last Tuesday and Wednesday afternoons, when the proposed evacuation of British troops from Egypt was announced. But we have not heard the last word of the Egyptian question, and of its related questions of Middle and Near East policy. The clouds of war still drift over Palestine and Greece and the Balkans, and rumours of war come out of Eastern Europe. The world is very unstable and the threat of world famine does not recede.

Talk in the lobbies of the House is that the margin of food safety in Europe is one of weeks, not months. So that Mr. Herbert Morrison's visit to President Truman has special significance. It is one more attempt to lift the consideration of these fundamental political and economic matters out of the fog of national politics and national prejudices into the UNO world of instructed understanding.

MEDICUS, M.P.

FROM THE PRESS GALLERY

New Towns for Old

In moving the second reading of the New Towns Bill in the House of Commons on May 8, Mr. L. SILKIN, Minister of Town and Country Planning, recalled that it was Sir Thomas More who first deplored the suburban sprawl, and in his *Utopia* there were 54 new towns each 23 miles apart, and each divided into four neighbourhoods with local centre and community feeding-centre. Sir Thomas More, he admitted, had been beheaded, but that must not be regarded as a precedent for the treatment of town-planners. It was not unreasonable to expect that More's *Utopia* of 1515 should be translated into practical reality in 1946. There had been many other warnings about the ill effects of the growth of London and other large towns. Queen Elizabeth was disturbed about it, when London had a population of 120,000, and in 1580 "an Act against new building" was passed which made it an offence to erect any dwelling-house within the city of London or city of Westminster, or within three miles of the gates of those cities. The penalty was £5. The Act was quite ineffective, and soon became a dead letter, but remained on the Statute Book until 1888. By that time London had a population of some four millions. In 1898, in *Garden Cities of Tomorrow*, Sir Ebenezer Howard advocated the building of new self-contained towns surrounded by an agricultural or rural protective belt, and he was himself responsible for the creation of Letchworth in 1903, which was planned for a population of about 35,000, but which at the outbreak of the war had a population of under 18,000. He was also the founder of Welwyn Garden City, started in 1920 for an ultimate population of 50.000, but which in 1939 had a population of about 15,000.

Thus the failure to deal with suburban sprawl was not due to any lack of warnings, commissions, or reports. Between the wars some 5 million houses were built, and the effect on the countryside and our towns had been almost calamitous. Large numbers of people in the towns were living in overcrowded conditions, and housing estates built on the outskirts had largely failed to provide a better life for the people. Today there was a need for another 5 million houses, but if they were to be built on the outskirts of our towns with the same lack of planning as before, Mr. Silkin dreaded to think what this still fair land of ours would be like in 10 or 15 years. The houses now to be built must be carefully located in new self-contained communities. This applied not only to London, but almost equally to such places as Liverpool, Manchester, Glasgow, Leeds, Portsmouth, and Plymouth, each with a population ranging from 40,000 to 250,000 people for which it could not provide housing within its own boundaries. The building of new towns was the only satisfactory method of providing accommodation for the overspill population, and an effective policy for their creation must be part of our post-war replanning.

This Bill, which applied to Scotland as well as to England and Wales, provided that the Minister of Town and Country Planning would appoint a development corporation to be responsible for the building of each new town, or the substantial enlargement of an existing town. The corporation would consist of a chairman, a vice-chairman, and up to seven additional members who would be appointed by the Minister after consultation with the appropriate local authorities. They would be given the widest possible powers of estate management, but would not have any of the local-government functions of a democratically elected authority. These would remain vested in the local authority. The Bill contained machinery for the compulsory acquisition of land in the designated area. Capital moneys required for development would be provided by loans from the Consolidated Fund up to £50 million. When that had been spent it would be necessary to ask for further Parliamentary authority. It was estimated that this money would last for five years. There would be a careful check on capital expenditure, but the Minister and the Treasury must be satisfied that the expenditure was likely to produce for the corporation a reasonable annual return. The Exchequer would also pay to the corporation the appropriate housing subsidy in respect of working-class houses built by or for the corporation. It would also provide by way of subsidy the expenses of the corporation, which might amount to between £30,000 and £40,000 a year for each new town in the early years of development. It was estimated that the capital cost to public funds of the development of each new town would be about £19 million, on the assumption that most of the middle-class houses, the shops, and the factories would be built by private enterprise.

After a debate, in which one of the main points of criticism raised was that the Government ought not to restrict the agencies to a Government Corporation, the Bill was given an unopposed second reading.

National Insurance Bill

The Government have tabled an amendment to this Bill which does away with the proposal that the self-employed shall wait 24 days before receiving benefit. As a result the self-employed man's contribution will be raised from 5*s.* 9*d.* to 6*s.* 2*d.* and the woman's from 4*s.* 10*d.* to 5*s.* 1*d.* The Exchequer will contribute another 1*d.*

QUESTION TIME

Spens Report

In informing Mr. S. HASTINGS that the Report of the Spens Committee on the remuneration of general practitioners was now available, Mr. BEVAN, Minister of Health, said that he had not yet reached a decision as to the implementation of the report. He would have to have discussions with the representatives of the doctors before he reached any decision.

Unpasteurised Milk

Mr. PETER FREEMAN asked the Minister of Food whether he would see that those who desired to have unpasteurised milk should be provided with opportunities to secure it in all areas where it was being subjected to this heat treatment.—Sir BEN SMITH replied: For the present it is necessary to maintain the restrictions on the consumer's choice of milk retailer and I regret that I cannot give my hon. friend the general assurance for which he asks.

Distribution of Penicillin

Dr. R. CLITHEROW asked the Minister of Supply in view of the announced Government policy of making penicillin available on prescription to the general public as and from

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June 1, what consultations he had had with the Pharmaceutical Society of Great Britain over this important question; if he was aware that the terms of the order, made under the Defence Regulations prescribing the conditions of sale, had not been made known to the society; and why this matter was decided and given publicity without the professional organisation most concerned in the distribution of this product, particularly for National Health dispensing, being informed.—Mr. W. LEONARD, parliamentary secretary to the Ministry of Supply, said: We have not yet completed our arrangements for the distribution of penicillin. Discussions with the Pharmaceutical Society are taking place. No control order has so far been made.

Incidence of Diphtheria

Replying to a question, Mr. A. BEVAN stated that the provisional number of cases of diphtheria notified in England and Wales in 1945 was 18,571, and of deaths 720. The ages of the cases were as follows:

	Notifications	*Deaths*
Aged 0–	188	18
1–	1086	113
3–	2001	120
5–	5948	257
10–	3467	74
15–	3330	45
25 and over	2421	93
Unknown	130	0
	18,571	720

Replying to a further question, Mr. J. WESTWOOD gave the following figures for Scotland:

	Cases		*Deaths*	
Age-group	*Imm.*	*Non-imm.*	*Imm.*	*Non-imm.*
0– 4	267	1175	1	76
5–14	1104	1151	5	29
15+	153	810	–	15
Totals	1524	3136	6	120

Blood-transfusion Service

Sir W. WAKEFIELD asked the Minister of Health if he was satisfied that he had adequate supplies of blood for transfusion purposes; and what steps he was taking to ensure that a sufficient number of donors was available.—Mr. BEVAN replied: The Emergency Blood Transfusion Service has had difficulty in recent months in obtaining adequate supplies of blood. I have arranged for a film on this subject to be shown in cinemas and for a series of local campaigns to take place during the summer months throughout the country to encourage people to give blood. The need is as urgent now as it was in war-time. I hope those who have helped will continue to do so, and that new helpers will enrol when an appeal is made in their locality.

Mr. E. H. KEELING: Will the Minister consider forming a branch of blood-donors in this House, especially as a little blood-letting might do some Members good? (Laughter.)—Mr. BEVAN: Certainly, I will encourage that, and I would like to apportion the donors. (Laughter.)

Family Census

Major TUFTON BEAMISH asked the Minister whether he would discontinue the practice of sending form F.C.4 to those persons who had expressed their unwillingness to fill in the proforma at present being circulated by the Royal Commission on Population and headed "family census, strictly confidential"; and whether he was aware that the practice of sending out the form had caused the recipients considerable annoyance.—Mr. BEVAN replied: I am informed that F.C.4 is a formal letter issued by the commission which gives those women who did not want to supply census particulars to a local enumerator an opportunity of supplying them confidentially and direct by post to the commission's headquarters. The response to this letter has been gratifying and will do much to make the voluntary family census a success. This part of the work will be completed in about a fortnight's time, after which no further copies of F.C.4 will be issued.

Extension of Woking and District Victoria Hospital

Mr. G. NICHOLSON asked the Minister whether he would now sanction the scheme proposed by the Woking and District Victoria Hospital for adding 50 beds to their accommodation by means of hutments.—Mr. BEVAN replied: I have considered this carefully in the light of the present position of building labour and materials, but I am afraid I cannot recommend the necessary licence at the moment.

Letters to the Editor

SHORTAGE OF NURSES

SIR,—All doctors, whether in general practice or attached to hospitals, are greatly concerned about the shortage of nurses and must be interested in possible remedies. The problem is so urgent that it must be faced even in the midst of our own professional upheavals.

Many suggestions have been discussed, and I wish to emphasise one which, if taken up on a national scale, might in my opinion go far to provide a permanent solution of this very serious problem. The remedy suggested has, I believe, already been tried in some places in a small way, but it could only have a real effect if carried out nationally.

There is a gap between the ordinary school-leaving age of girls and the age at which they are commonly admitted to our hospitals to begin a nursing training. In this gap many girls, keen to become trained nurses, are lost because they must take up other work and careers at once. A few, who can afford it, fill in the time by a training in domestic science.

I suggest that this gap might be filled by the foundation of a Cadet Nursing Training Corps, on a national basis, but with training schools or colleges distributed regionally throughout the country. Selected girls would enter immediately after leaving school, and the cadet school might be run on the usual three-term system with adequate holidays. In the training, elementary anatomy, physiology, cookery, and visits or demonstrations in hospitals would no doubt find a place. The training would largely or completely replace the concentrated three months of the preliminary training school in hospitals, and would allow practical work in the wards to be started at once.

The success of a Cadet Nursing Training Corps would entirely depend on its attractiveness to girls of the right age—attractive buildings and even attractive uniform. Everything in fact to create a pride in the work and the school. The questions of residence in school or at home, payment during training, and scholarships are all important but not fundamental.

A Cadet Nursing Training Corps might be started more easily in the first place by a body such as, for example only, the Nuffield Foundation, aided by medical and nursing organisations. Memories of direction and conscription, essential during the war, may be too recent for a successful start in other ways.

Department of Medicine,
University of Glasgow. J. W. MCNEE.

THE G.M.C.

SIR,—A recent case has led to considerable criticism of the General Medical Council, but the suggestion that lawyers should join the council is surely a bad one. We know that hard cases make bad law but we also know that *de minimis non curat lex*. If a doctor has offended against the ethics of his profession, he should be tried by his peers, and the issue should not be muddled by what may well be irrelevant legal details.

There are however two items that need reform. The first is the age of the members of the council. Anyone who has seen them in session will know that, though they present a nestorian aspect, they also show, as indeed their years compel, many of the physical signs of old age—a state which does not always encourage sympathy or percipience. The second possible danger to justice lies in the Hippocratic Oath. A man who has sworn never to divulge his patient's secrets is, if the patient rounds on him, unable to defend himself fully—an especial danger when adultery is alleged.

London, W.1. CHRISTOPHER HOWARD.

PSYCHOLOGICAL ASPECTS OF PSORIASIS

SIR,—The view held by a few patients with psoriasis that this is a healthy man's disease is indeed curious, as Dr. E. Wittkower observes (April 20, p. 566). But on p. 175 of J. A. Lindsay's *Medical Axioms* are found these words, attributed by him to Jonathan Hutchinson: "An attack of psoriasis is a certificate of good health."

Truro. H. PULLAR-STRECKER.

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MILESTONE IN ANÆSTHESIA

SIR,—The respect which an anæsthetist has for physicians we must make every effort to reciprocate. But when he eases the minds of his anæsthetic colleagues about curare adjuvancy, as by his letter of April 20 (p. 591) he is bound to do, I cannot help feeling that Dr. Langton Hewer is showing himself an anæsthetist of the confident era. Lest the cases which he cites of a fortunate outcome of careless overdosage should persuade anæsthetists that endotracheal oxygenation is all that they require to combat poisoning by curare, I would plead with respectful reiteration not only for the endotracheal catheter to be early in position, but for the use of pure standardised preparations of curare alkaloids in *minimum* effective doses. I too have seen pretty "fantastic" dosage by curare followed by recovery with artificial respiration alone. But I have also seen embarrassing bronchial hypersecretion and a near fatality from sudden bronchospasm following the (intravenous) injection of a dose of "curarine" insufficient to abolish spontaneous respiration (*Lancet*, 1936, i, 12).

This bronchospasmodic action of curarine has been fully demonstrated in animals (*J. Physiol.* 1938, **91**, 437) and I hope that Dr. Hewer will not encourage us to forget it until we know more about the pharmacology of curare alkaloids than we do at present.

Edinburgh. RANYARD WEST.

MASS RADIOGRAPHY

SIR,—Dr. Beynon suggests that my opinion is founded on unfamiliarity with the actual working of mass-radiography units. As he has "Since 1941 . . . followed with keenness Dr. Brailsford's writings on this subject" he ought to have appreciated that my criticisms, which were primarily based on many years' experience in teaching hospitals, were published before the Ministry propounded its scheme or installed units. They are adequately supported by the findings of those units, of which I have ample knowledge to justify my reiterated assertions.

He asked in a previous letter (March 16) the basis for my assertion that the miniature was inferior to the direct film, and it would seem from his later statement (April 27) that "the fundamental issue is not whether the large film is superior to the miniature film," followed by an acknowledgment of the miniature's inferiority, that he has adopted my view of their respective values. If he will again read my articles, he will find the answers to his latest requests for better alternatives.

He asks, "Would he waste valuable medical manpower in the taking of histories from the 93% of those examined who will be found to have radiologically normal chests?" I would not consider this a waste of time for any medical man if the patient had signs or symptoms of pulmonary disease or had been in frequent contact with open infection; a clerk may fail to elicit any of this evidence. Of the 7% abnormals, many show indefinite radiological appearances and perhaps no clinical signs, and offer no symptoms or suggestive history. After months or years of observation, one may decide that the shadows are not of progressive significance, and yet a few weeks later the altered condition of the patient may show the decision to have been erroneous. Even of those patients who continue to show radiographic appearances indicating active pulmonary tuberculosis a proportion remain at work, as Dr. Beynon will find if he repeats the examination of his industrial group in 6–12 months; treatment is not compulsory and, even when accepted, is not always curative.

Dr. Beynon says he can assure me "that abnormal cases get due attention at every stage and that their history is taken by a competent and experienced medical officer." The salary offered to medical officers (£750) for this mass-production is unlikely to tempt the competent and experienced physician, tuberculosis officer, or radiologist. Most of these realise that a good proportion of patients referred with symptoms or signs or histories of contact show no abnormal radiographic evidence; on the other hand, some show radiographic signs of early pulmonary tuberculosis which are undetected by competent clinicians who have the patient, with definite signs, symptoms, and history, before them. How can Dr. Beynon expect a high degree of accuracy when the most essential task of sifting the miniatures is done by probably the least experienced (certainly the worst-paid) member of the medical team, who has no patient or history to guide him, and who must in addition to his other work judge 920 miniatures and carry out an efficient examination of 60 patients in each eight hours of service? (Dr. Beynon's figures). I presume that as director he would supervise the 2880 per day.

He asks, "How can efficiency suffer when three separate teams are each working an eight-hour shift throughout the 24 hours?" Even if the most competent authorities were employed, the standard first attained would tend to degenerate, and with the less competent unnoticed, the deterioration would be still more assessable.

Finally Dr. Beynon has failed to grasp the meaning of my analogy of the few more rods. My point was that mass radiography (of any but the groups I indicated) is no more a measure for eradicating tuberculosis or materially diminishing its incidence, than would be the supply of more *rods* with more attractive bait for ridding a lake of infected fish. The comparison can be carried further: some through fear or illness will not bite; some have been caught before, and once bitten twice shy; while even those caught and thrown back into the pool as uninfected may indeed be recently infected. Others cured or unaffected may be damaged, infected, or even killed, in the process; yet no matter how many are caught the pool will still contain its infectious residue to which all are exposed.

I am confident that he will succeed in detecting more and more cases of pulmonary tuberculosis, but I am equally confident that with this meretricious scheme for the eradication of tuberculosis he will do little more than add to the responsibilities and anxieties of his associated tuberculosis officers.

Birmingham. JAMES F. BRAILSFORD.

PRECAUTIONS WITH THROAT PACKS

SIR,—Deaths have been recorded as a result of failure to remove the throat pack when tracheal tubes are withdrawn after tonsillectomy.

I have recently instituted a simple routine to avoid such accidents.

All throat packs are soaked in 'Vaseline' and kept in a separate tin on the anæsthetic trolley. Thus no packs can possibly be involved in the sister's swab count at the end of the operation. The lid of the tin is red, and across it in white letters is painted "throat pack in." Directly the tin is opened the lid is hung up on the trolley in a prominent position. It is not replaced until the pack is removed from the throat.

Devonport. H. PARRY-PRICE.

PARASCHMITZ DYSENTERY

SIR,—In his article of April 20 (p. 573), Dr. N. H. Martin writes, "Most of the reports have come from India, the Middle East, and the Mediterranean littoral."

The Schmitz-like organisms form a group, which might well be called the Schmitz group, in the same way that one speaks of the Flexner group.

Some years ago I described one of these Schmitz-like organisms, which produced attacks of typical mild bacillary dysentery in two young male Europeans, whose blood agglutinated the organism in dilutions up to about 1 in 200. The blood of these two patients would not agglutinate a strain of *Shigella schmitz* obtained from the National Collection of Type Cultures (N.C.T.C.) at the Lister Institute; nor would the N.C.T.C. organism agglutinate with antisera made by injecting the isolated strain into rabbits. We did not give our strain a name (it was known in the laboratory as *B. youngi*), and the culture I intended to send to the N.C.T.C. was lost while I was on leave; but fairly full details of it were reported.[1]

At that time the *Shigella schmitz* was not officially accepted as a cause of illness in human beings; the organism is mentioned in the Medical Research Council's *System of Bacteriology*, but only as a very doubtful and uncorroborated cause of bacillary dysentery. Views have changed since then.

St. Margaret's Hospital, Epping, Essex. FRANK MARSH.

1. Marsh, F. *J. trop. Med. (Hyg.)* 1929, **32**, 205.

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ŒSOPHAGEAL SPEECH

SIR,—Your leading article of March 2 says that the acquisition of œsophageal speech after removal of the larynx, once a rare achievement, is now the normal outcome. The method is, however, by no means new; it was described, almost exactly as it is used today, by my teacher, G. Gottstein, some fifty years ago.

He showed his first case at the 29th congress of German surgeons in 1900; the patient, eighteen months after laryngectomy, was able to talk and sing with a "pseudo-voice," as it was named by Landois. A second patient (*Allg. med. ZentZtg.* 1905, no. 34) had good œsophageal speech only 6½ weeks after operation. As assistant surgeon at the Jewish Hospital at Breslau, I later operated with Gottstein on several patients who subsequently developed œsophageal speech.

At that early date Gottstein was aware of the vocal mechanism at the entrance to the œsophagus; he also measured with a spirometer the quantity of air required for the intonation of the various consonants and vowels.

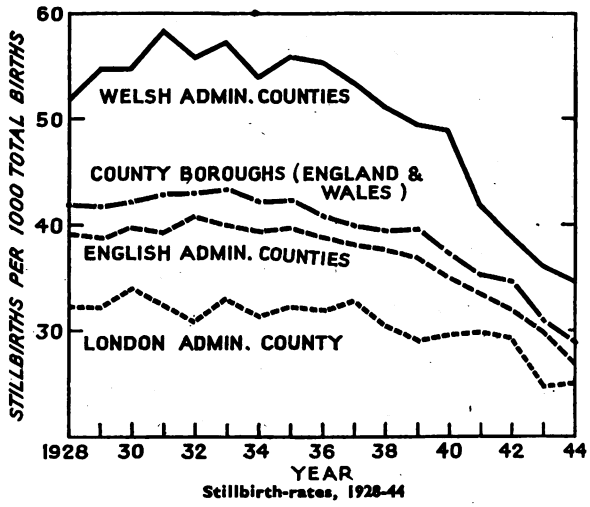
Gottstein may thus be remembered as having understood and practised the principles of œsophageal speech several decades before the technique was generally adopted.

Tel-Aviv, Palestine. WILLIAM BOSS.

THE SECULAR TREND IN THE STILLBIRTH-RATE

SIR,—In England and Wales there are at present about 20,000 stillbirths a year, a figure equivalent to 65% of the total infant deaths under 1 year of age. This large wastage of life at birth is particularly serious in view of the declining birth-rate. Though the stillbirth-rate is steadily falling, the possibility and the importance of a further reduction have yet to be more widely appreciated.

Stillbirths have been registrable in England and Wales since the middle of 1927. The figures published by the Registrar-General for the seventeen years 1928–44 make it possible to investigate the trend in the stillbirth-



Stillbirth-rates, 1928-44

rate during that period. A detailed preliminary examination of these figures shows a wide variation in the mean stillbirth-rate between different areas. The data divided into four groups—London administrative county, the other English administrative counties, the English and Welsh county boroughs, and the Welsh administrative counties—show very clearly the differing experience in the four types of area, and that their relative positions are unchanged in the whole period. (The experience of the urban aggregates did not differ significantly from that of the rural aggregates, and so they have not been kept separate.) The stillbirth-rate does not appear to increase with density of population, since the Welsh counties have a considerably worse experience than the aggregated county boroughs in England and Wales. In recent years the inequalities between the groups have become less marked.

The trend in each group is more or less the same—an initial slight rise until 1932 or 1933, followed by an increasingly rapid decline. The slight rise may be due in part to defective registration in the early years, and so no significance can be attached to it. Thereafter the decline is definite. It is especially worthy of remark that it should have accelerated under war conditions, when so many factors would appear to militate against it. Does it perhaps reflect the increased care which has been taken of the health of pregnant women during the war?

In the Welsh counties the decrease between 1938 and 1944 is no less than 33% of the pre-war figure—an astonishing reduction. In London, despite the bombing, the corresponding decrease is 18%. Little is yet known of the basic causes of stillbirth, and of the relative influence of social and of more specific factors. The reasons for the decline are therefore obscure and further investigation is necessary.

Institute of Social Medicine, Oxford. IAN SUTHERLAND.

OPERATION FOR VARICOSE VEINS

SIR,—It was suggested to me that during the operation of high resection of the internal saphenous vein the manipulation, clamping, and section of the vein caused a marked fall in blood-pressure.

I have taken careful observations on some twenty consecutive cases operated on by Mr. R. R. Foote. In no case was I able to find any marked change in blood-pressure throughout the operation. In a certain number of cases there was a slight but insignificant rise of pressure at the time of section of the vein.

London, S.W. F. BARNETT MALLINSON.

Towards Social Security

Behaviour during Sickness

WHEN friendly societies began, in early times, to pay cash allowances to their members who were unfit for work they felt a need for some supervision over the claimant beyond that exercised by his doctor. The committees and officers in financial charge of diminishing funds, sometimes too small for their proclaimed purpose, set to work to devise checks and tests which could be used to winnow out the doubtful cases. As may be imagined, these provisions varied considerably between society and society; but as they were adopted (in theory at any rate) by the members as a whole in general meeting, people who did not like them had to accept them as part of the price of voluntary membership.

When compulsory insurance was introduced in 1912 a measure of uniformity was required, and thus we have what are called the Rules for Behaviour during Sickness.

The most prominent rule is the one stipulating that the claimant shall not be absent from his place of residence for the time being between a specified time in the evening and a specified time in the morning. These times vary between winter and summer and between society and society. There is a further provision that a claimant shall not be absent at *any* time without leaving word where he may be found. There is also a general proviso under which the society may, if it thinks fit, exempt the member from the operation of this rule upon such conditions, if any, as it may impose; but in practice, of course, members hardly ever trouble to apply for permission to be out after hours, even when they have good cause, and the problem arises only as a result of an unexpected evening call from the sickness visitor. In the hands of reasonable people such a rule can be tolerated; but the instructions to local officers under the new Ministry of National Insurance will have to be framed so that decisions will be based on all the circumstances of the case. For example, a claimant suffering from a simple fracture and living in overcrowded conditions ought—especially in the summer months—to be allowed automatically some latitude in the hour for returning home. Many cases could be instanced where it would be medically wise for a patient to be out in the fresh air as much as possible and where he could not be expected to leave at home a detailed statement of the route he proposes to take.

Again, the standard rules forbid the patient from doing "any kind of work, domestic or other," except light work undertaken as a part of medical treatment in an institution, or work undertaken in training for some other occupation. Clearly, such a written rule would not have survived in recent years unless it had been viewed with a Nelsonian eye. Obviously it needs

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radical overhaul in the light of medical opinion, since it is now recognised that mental or physical activity is often an essential part of the process of restoration to normality.

Two things are necessary. First, the administrators must rethink their rules with medical help. Secondly, the new form of administration must provide simply and naturally for the doctor's advice on a particular case to be the predominant factor in the day-to-day decisions on the niceties of behaviour during sickness. JUSTINIAN.

Public Health

Payment for Treatment of School-children

THE Education Act of 1944 imposed for the first time on local education authorities the duty of providing medical treatment (other than domiciliary) for children attending maintained schools. The Minister of Education, in consultation with the British Medical Association, the British Hospitals Association, and the local education authorities, has been considering how the expenses of this new service can best be met. As a national basis it has now been agreed that the authorities shall pay voluntary hospitals three-quarters of the cost of treatment for inpatients and outpatients, subject to maxima of £1 4*s*. per patient-day for teaching hospitals and 18*s*. for other hospitals. The authorities will also make additional payments to hospitals for distribution to their consulting physicians and surgeons. For each inpatient £1 1*s*. will be paid to cover any period up to seven days, and for outpatients 10*s*. 6*d*. for each new case to cover attendances up to three months. Existing arrangements for payment for operative treatment of tonsils and adenoids, mastoid diseases, and squint may stand. Where authorities enter into a contract with consultants for treatment given at school clinics or hospitals there will be a fee not exceeding £3 3*s*. for a session of two hours or of 12*s*. 6*d*. for each case. These arrangements are retrospective with effect from April 1, 1945. They are designed to tide over the period till the National Health Service comes into operation, and are subject to review at the end of 1947.

Births and Deaths in the First Quarter

The Registrar-General's Weekly Return for May 11 gives provisional figures for births, marriages, and deaths in the quarter ending March 31. There were 181,445 births—an increase of 3498 compared with the corresponding period last year, and the birth-rate of 17·2 per thousand population is 0·3 above that for the first quarter last year, and only 0·2 below the high rate recorded in the first quarter of 1944. The average for the first quarters of the five years prior to 1945 was 15·7. The difference between the number of stillbirths was so small—5178 compared with 5190 in the first quarter of last year—that the rate of 0·49 per thousand population applied for both periods.

Deaths totalled 155,153 against 157,745 a year ago, making the rate 14·8. This is 0·2 below that of the corresponding period in 1945 and 0·9 below the average for the first quarters of the five previous years.

Infectious Disease in England and Wales

WEEK ENDED MAY 4

Notifications.—Infectious disease: smallpox, 0; scarlet fever, 945; whooping-cough, 2147; diphtheria, 367; paratyphoid, 6; typhoid, 5; measles (excluding rubella), 2711; pneumonia (primary or influenzal), 610; cerebro-spinal fever, 58; poliomyelitis, 3; polio-encephalitis, 2; encephalitis lethargica, 1; dysentery, 212; puerperal pyrexia, 168; ophthalmia neonatorum, 98. No case of cholera or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on May 1 was 1131. During the previous week the following cases were admitted: scarlet fever, 39; diphtheria, 38; measles, 104; whooping-cough, 30.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 3 (0) from measles, 13 (4) from whooping-cough, 3 (0) from diphtheria, 55 (4) from diarrhœa and enteritis under two years, and 14 (1) from influenza.

Liverpool reported 11 deaths from diarrhœa and enteritis.

The number of stillbirths notified during the week was 264 (corresponding to a rate of 30 per thousand total births), including 34 in London.

Obituary

SIMON FLEXNER

M.D., D.SC., LL.D.

Simon Flexner, who died in New York on May 2 at the age of 83, was born at Louisville, of Jewish parents; his younger brother, Abraham, won distinction as an educator and writer on pedagogics. He was educated at local schools, before entering the University of Louisville, where he qualified in 1889. He studied for a time at Johns Hopkins Hospital and made several trips to Europe, visiting Strasbourg in 1893, Paris in 1900, and Berlin in 1904. In 1895 he was appointed associate professor of pathology at Johns Hopkins University, and three years later he was promoted to the chair of pathological anatomy. In 1899 he accepted the appointment of professor of pathology at the University of Pennsylvania, where he remained until 1903, when he became director of the Rockefeller Institute for Medical Research. He retained this post until he retired in 1935.

Underwood

Of Flexner's many contributions, the most memorable are those on cerebrospinal fever and poliomyelitis. He proved that a successful antimeningococcal serum could be produced and its therapeutic value assessed; and he and his American colleagues were among the first to show that poliomyelitis can be transmitted to monkeys and is due to a virus.

F. R. F. writes: When Simon Flexner was director of the Rockefeller Institute, the resident appointments at the institute hospital were held by a small group of young men who came from various countries throughout the world and were graduates of universities that differed widely in their forms of education and training. Their common characteristics were devotion to medicine and the probability that they would themselves become teachers of medicine in the universities of their own countries. Flexner joined the residents at lunch whenever he could, and on these occasions he would describe recent progress in some field of research, weighing and integrating the contributions of this worker in America, of that one in Europe, or of a third in Asia, and suggesting lines of further investigation. He would talk about medical education in many lands, telling us more about our own medical schools than we ourselves knew; and he would draw us out so that we began to see new aspects and new significance in our own experiences. His mind was essentially critical, but his criticism was kindly and constructive, and its purpose was usually practical, with the advancement of preventive or curative medicine as its goal. Those of us who assisted, however humbly, in his researches were especially fortunate, for we had to strive to reach his technical accuracy and to share his mental discipline; and we learned how crucial is the difference between the proven and the plausible. The group was scattered by the first world war, but the survivors have all found places where they in their turn have influenced their younger colleagues. The interest of Simon Flexner was a source of strength and pride which has supported them in their difficulties and strivings. The memories that come to mind are of a strong and vigorous personality, of an intellect moulded by scientific discipline, and of a tolerant and affectionate friendship. He was a leader, and his influence on medical science has been a powerful factor in the great advances of his time.

WILLIAM FRANK LYDSTONE DAY

M.B. CAMB.

Dr. W. F. L. Day, who died at Truro on April 27 at the age of 68, was the third of four generations of doctors in his family. His grandfather was Dr. F. N. Day of Chudleigh, his father Dr. R. N. Day of Harlow, Essex, while his own elder son, Dr. F. M. Day, is acting

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medical officer of health for Hammersmith. Educated at Cheltenham College, Caius College, Cambridge, and at St. Mary's Hospital, London, he obtained his M.B. in 1903, and after holding house-appointments at the South Devon and East Cornwall Hospital, Plymouth, he became resident medical officer at the borough sanatorium, Brighton. At Cambridge he narrowly missed his blue for cricket, and later he played for Cornwall. During the 1914–18 war he served with the R.A.M.C., and on his demobilisation he returned to the West Country as assistant tuberculosis officer for Cornwall, later becoming county tuberculosis officer. He retired during the last war owing to ill health. His wife, a daughter of the late Dr. Williams, M.O.H. for Plymouth, survives him with two sons.

On Active Service

CASUALTIES

DIED AS PRISONER OF WAR

Captain WILLIAM SERVICE AIRD, M.B. Glasg., R.A.M.C.

DIED

Lieutenant ROSETTA CATHERINE BARKER, M.B.Belf., R.A.M.C.
Major MURDO BUCHANAN, M.B. Glasg., R.A.M.C.
Major VIVIAN ROY CLIFTON, M.B. Sydney, R.A.M.C.
Captain JOHN MICHAEL HAMER, M.R.C.S., R.A.M.C.
Captain ALAN ROSS SHERIFF, M.B. Durh., R.A.M.C.

WOUNDED

Lieut.-Colonel A. G. FERGUSSON, M.D. Glasg., R.A.M.C.
Major HILDA ROBERTS, M.R.C.S., R.A.M.C.

Medical Diary

MAY 19–25

Tuesday, 21st

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Orthopædics.* Short communications.
LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital for Diseases of the Skin, Leicester Square, W.C.2
5 P.M. Dr. J. E. M. Wigley: Eczema.

Wednesday, 22nd

ROYAL SOCIETY OF MEDICINE
5.30 P.M. *Endocrinology.* Sir Walter Langdon-Brown: Inaugural Address.

Thursday, 23rd

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. J. Charnley: Conservative Treatment of Fractures of the Femoral Shaft. (Hunterian lecture.)
ROYAL SOCIETY OF MEDICINE
8 P.M. *Urology.* Mr. A. H. McIndoe: Congenital Deformities of the Penile Urethra.
MEDICO-LEGAL SOCIETY
8.15 P.M. (26, Portland Place, W.1.) Dr. W. Norwood East: Crime and Maturity.
ROYAL PHOTOGRAPHIC SOCIETY, 16, Princes Gate, S.W.7
6.30 P.M. *Medical Group.* Papers and discussion: Methods in Medical Photography.
LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. W. N. Goldsmith: Acneiform Eruptions.

Friday, 24th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Epidemiology and State Medicine.* Dr. P. G. Stock: Progress and Problems in Port Health Administration.
SOCIETY OF MEDICAL OFFICERS OF HEALTH
2 P.M. (B.M.A. House, Tavistock Square, W.C.1.) Dr. J. J. Buchan: Organisation of Medical Work.

Saturday, 25th

ROYAL SOCIETY OF MEDICINE
Pædiatrics. Meeting in Birmingham.
MIDDLESEX COUNTY MEDICAL SOCIETY
3 P.M. (Shenley Hospital, near St. Albans.)

Appointments

BADENOCH, A. W., M.D., CH.M. Aberd., F.R.C.S.: asst. surgeon, St. Peter's Hospital for Stone, London.
BOYLE, T. McM., M.B. Leeds, F.R.C.S., D.L.O.: aural surgeon, General Infirmary, Leeds.
LIPWORTH, MAX, M.D. Edin., M.R.C.P.E.: factory surgeon for Manchester, S.E. Lancs.
LLOYD, J. E. S., M.D. Lpool, M.R.C.P., D.P.M.: medical superintendent, Tooting Bec Hospital, L.C.C.
MACLEOD, CAMERON, F.R.C.S.: consulting surgeon, Essex County Hospital, Wanstead.
MILNER, J. G., M.B. Camb., F.R.C.S.: ophthalmic surgeon, Charing Cross Hospital, London.
SHUCKSMITH, H. S., M.B. Leeds, F.R.C.S.: asst. surgeon, General Infirmary, Leeds.
SIMMONS, H. J. A., M.B. Camb.: factory surgeon for Manchester, S.W. Lancs.

Notes and News

EDINBURGH STUDENTS AND THE BILL

AT a meeting in Edinburgh on May 3, organised by the Royal Medical Society and the University Medical Association, Dr. A. F. Wilkie Millar said that, while he agreed in principle with the measures in the National Health Service Bill, he was perturbed by the separation of clinic and hospital control; he was also opposed to appointment by the Minister of committees with a wide range of power. In the loss of goodwill he saw a drift away from the essential doctor-patient relationship, in which the physician gave of his best to maintain the value of his practice. Finally, in receiving State support, the doctor would be divided in his allegiance. Sir Alexander Macgregor said that as a medical officer of health he had experienced none of the bureaucratic disadvantages that some people feared. He objected, however, to the omission of preventive medicine from the Bill. Prof. Sydney Smith considered that the Bill offered an unequalled opportunity for the coördinated advance of scientific medicine. The newly qualified practitioner could enter the service at a reasonable salary instead of working as an underpaid house-man whose main duties were clerical. He envisaged greater mobility of hospital staffs, and suggested a period of probation after qualification during which the young doctor should be under the control of a senior member of the profession in hospital or elsewhere.

Students who spoke approved of the broad principles of the Bill, and emphasised that it was for the profession, by its criticism and support, to make the service the best possible. The new challenge of direction (in the general sense) by a director must be taken up. In summing up, Dr. Wilkie Millar said that there appeared to be as much indecision among the unqualified as among the qualified members of the profession.

PROTECTION DURING IMMERSION

ONE of the problems which had to be overcome during the war was that of devising suitable protection for aircrew and others who ran the risk of prolonged immersion in the sea. Early research showed that three criteria must be fulfilled: (1) the free circulation of cold water round the body must be prevented; (2) a layer of heat-insulating material between the body and the sea must be preserved; and (3) any protective garment must be comfortable. A "flying overall" that answered these requirements was finally devised by the combined efforts of the Royal Air Force Institute of Aviation Medicine and the Cotton Research Association, with the help of British manufacturers. It is made of a special Oxford weave cloth with 'Tropal' interlining. A 5-oz. interlining supports a 12-stone man in water and retains its buoyancy almost indefinitely; it has insulated bomber crews against cold, and kept fighter pilots cool in the heat of the cockpit. Squadron-Leader E. A. Pask, M.B., writes in the current issue of the *Maker-up* that a man immersed in the northern waters of the North Sea in winter might die in 10 minutes and be incapacitated in a considerably shorter time; under these conditions the suit kept aircrew warm and dry while they inflated and boarded emergency rubber dinghies. Even after prolonged immersion the suits still provided protection by hindering the circulation of cold water round the body. The materials used in the manufacture of the overalls will be available for civilian clothes, including waterproofs.

FORESTALLING FIRES

ALL hospitals take a serious view of the possibility of fire, and guard against outbreaks. But it often happens, when emergencies come rarely, that equipment becomes obsolete and people become bored, unless special trouble is taken to keep both up to the mark. King Edward's Hospital Fund for London, after conferring with the chief regional fire officer for the London region of the National Fire Service, have just published a revision of their memorandum on Fire Precautions.[1] Responsibility for providing against the danger of fire naturally lies with the hospital committees, and the King's Fund do not attempt to say how far their suggestions may apply to any given hospital; but the notes here presented will help any committee to decide whether the fire precautions in their hospital are adequate. They cover fire risks in storerooms, cupboards, kitchens, and in other places likely to be locked at night; risks from heating, lighting, and power,

1. Obtainable from the King's Fund, 10, Old Jewry, London, E.C.2. Pp. 8. 6*d*.

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and from the storage of inflammable material (especially X-ray films which give off poisonous fumes on combustion); and risks due to accumulations of rubbish and litter. Fire-fighters should be able to get into roof-spaces and vaults without difficulty, and enough rescue-ladders should be provided; fire-exits should be clearly marked. Equipment, whether hand appliances or hose, should be ample, and kept in good condition. The responsible fire officer, who must see that drills and inspections are carried out, should have charge of all equipment and also of the alarm apparatus. In an outbreak the fire service should be summoned at once, without waiting to see whether the hospital equipment will suffice; and someone should be sent at once to the hospital entrance to direct the firemen to the scene of the fire. The memorandum ends with some general rules for treating different types of fires, and with an appropriate set of directions to be hung in the porter's lodge or beside the telephone switchboard.

Most hospitals will find some useful advice in the memorandum, which should itself prove a good precautionary measure.

BERIBERI IN A EUROPEAN OFFICER IN SOMALILAND

BERIBERI has recently been observed[1] in a European officer, aged 29, who was admitted to hospital after living 6 months in the Mijertein. The district, which is about 900 feet above sea-level, is very unhealthy, the shade temperature averaging 100° F, and often rising to 110° F. These conditions caused the patient to lose 20 lb. in weight, and no doubt predisposed him to beriberi through anorexia and gastro-enteritis. On admission there was œdema of the legs and severe polyneuritis, so that he was unable to rise from the squatting position. The heart was dilated and there was triple rhythm. The liver was somewhat enlarged and tender. The food taken by the patient had equalled or exceeded normal requirements with three exceptions: (1) thiamine (vitamin B_1) was 100·6 International Units (I.U.) below standard; (2) riboflavin (vitamin B_2) was 1·49 mg. deficient; and (3) vitamin D was 279 I.U. below requirements. The author disregards the last item on account of the high degree of natural radiation in the country. The patient's alimentary troubles must certainly have diminished absorption of other food elements, but to what extent it is impossible to calculate.

Immediate improvement followed the administration of thiamine, and yeast in the form of 'Marmite.' The œdema cleared up in a week; the patient was ambulant in two months, though he still had difficulty in mounting stairs. The cardiac impulse passed well inside the nipple-line, and the triple rhythm disappeared. The patient ultimately recovered completely.

THE VOLUNTARY SPIRIT

Sir Robert Gower, who appealed in a letter to the *Times* (April 4) for the retention of the spirit of voluntary service, is to sponsor the formation of an advisory council, which will support organisations whose status is threatened by legislation. A considerable number of people in private and public life have associated themselves with this aim. Sir Robert Gower's view is that, under the terms of pending legislation, the voluntary medical organisations are to be sacrificed on the altar of administrative neatness.

PROSPECTS FOR ALMONERS

DURING the past year the Hospital Almoners' Association and the Institute of Hospital Almoners amalgamated to form the new Institute of Almoners which now takes over the responsibility of managing the affairs of the profession. It will select and train candidates, grant certificates, and keep a register of qualified almoners. There are now 650 certificated almoners in the country—nearly twice as many as in 1939. The first annual report for 1945 of the new Institute notes that 208 appointments were made during the year, 67 of them to hospitals where certificated almoners had not been employed before. The demand for trained workers in this field always exceeds the supply, thanks to growing recognition of the value of the almoner's services. Not all hospitals yet realise, however, exactly what those services should be, and an appendix to the report, defining the almoner's functions, repays study. Her chief task is to help people "both through the best use of their own capabilities and through the resources of the family and community, to overcome personal and social difficulties, and to achieve the fullest possible measure of health and happiness." She is thus a considerable force in the psychological treatment of patients, and as such should not be hampered by the traditional service, associated with the name "almoner," of administering hospital or public charity. However, some hospital authorities still wish the almoner to prevent the abuse of the hospital facilities by patients able to pay fees, and to assess patients' ability to contribute to treatment. "These duties," the report states, "are clearly subsidiary to the main function of the almoner." Fortunately they are likely to become unnecessary under the prospective National Health Service.

1. Charters, A. D. *E. Afr. med. J.* 1945, **22**, 397.

MAKING HOSPITAL APPOINTMENTS

A NOTE under this heading in our last issue described the new procedure for making hospital appointments adopted by the Middlesex County Council. We should have made it clear that the novelty of this procedure lies in the fact that the selection of the candidates and their reduction to a very small number is to be made by a professional committee including not only senior medical members of the council's staff but also expert assessors from outside, probably nominated by the University of London.

University of Oxford

On May 2 the degree of doctor of medicine was conferred on J. F. Loutit and on J. N. Mills (in his absence). The degree of bachelor of medicine was conferred on M. B. McEvedy and T. H. S. Burns.

University of Cambridge

Dr. E. B. Verney, F.R.S., has been appointed to the newly formed Sheild professorship of pharmacology. The readership now held by Dr. Verney is to lapse. Other new medical posts include readerships in bacteriology, morbid histology, and medicine, and a research assistantship in pharmacology.

University of Manchester

Mr. Ernest Matthews, D.D.S., has been appointed professor of prosthetic dentistry and director of the prosthetics department of the university from Sept. 29 next. Mr. Matthews is at present lecturer in dental prosthetics in the university. Mr. Harry Brindle, at present senior lecturer in pharmacy, has been appointed professor of pharmacy in the university from Sept. 29 next.

Royal College of Surgeons of England

At a meeting of the council on May 9, with Sir Alfred Webb-Johnson, the president, in the chair, Prof. R. V. Bradlaw was re-elected a member of the board of examiners in dental surgery. It was decided, subject to the grant of the necessary powers, to establish a faculty of dental surgery in the college.

Dr. G. M. Vevers and Dr. A. J. Durden Smith were admitted to the fellowship.

The Walker prize was presented to Prof. E. C. Dodds, F.R.S., the John Hunter medal and triennial prize to Dr. Joan Ross, and the Begley prize to Mr. Otto Fleischner.

The council accepted the trusteeship of the Cecil Joll memorial fund, under which a triennial prize will be awarded for some surgical subject.

The Chase Farm Hospital, Enfield, the Seamen's Hospital, Tilbury, and the Broad Green Hospital, Liverpool, were recognised in respect of the resident surgical post required of the candidates for the final fellowship examination.

Diplomas of membership were granted to the candidates named in the issue of May 4 as having passed the final examination of the Conjoint Board, with the exception of six who already held the diploma. The diploma was granted also to J. R. Handforth, who has passed the final examination of the board.

Diplomas in medical radiodiagnosis and in medical Radiotherapy were granted, jointly with the Royal College of Physicians, to the candidates named on May 4.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting, with Mr. W. A. Sewell, the president, in the chair, J. D. P. Graham (Glasgow) was admitted a fellow of the faculty qua physician.

Nutrition Society

The society is to hold a conference at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, on Saturday, May 18, at 2 P.M. The subject will be Nutritional Experiences in Prisoner-of-war and Internment Camps in the Far East. Papers will be read by Lieut.-Colonel J. Bennet, Dr. D. A. Smith, Prof. R. G. Scott MacGregor, Dr. R. C. Burgess, Dr. E. K. Cruickshank, and Dr. Cicely Williams. The discussion will be opened by Dr. J. V. Landor.

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Society for Relief of Widows and Orphans of Medical Men

The annual general meeting was held on May 8 with Dr. R. A. Young, the president, in the chair. During 1945 £4800 was distributed among fifty-five widows. Each widow over sixty-five years of age received £75 and the others £60. A Christmas present of £15 was also made to each widow. The members of the society now number 282 and the invested capital is over £140,000. Membership is open to any medical man living within 20 miles of Charing Cross, and further particulars may be had from the secretary of the society, 11, Chandos Street, London, W.1.

Hunterian Society

The Hunterian Society last week restored its yearly custom —broken by the war years—of a dinner to commemorate John Hunter's birthday. This year, the 218th anniversary, the guests included the presidents of the Colleges of Physicians and Surgeons, Sir Andrew McFadyean, Sir Malcolm Hilbery, K.C., and the Deputy Master of the Society of Apothecaries. Sir Malcolm Hilbery, proposing the toast of The Society, suggested that the profession was exposed to a double danger —fracture-dislocation with its past, and aneurinism. Mr. A. E. Mortimer Woolf, the retiring president, in his reply, appealed for the preservation of tradition. "There is a fashion today for tradition to be swept away. Tradition born of experience should be handed down from generation to generation." Lord Moran, P.R.C.P., questioned whether the tendency towards techniques had gone too far. The learned professions had lost their leisure, and thereby had largely ceased to be learned. Material progress there had been, both in medicine and surgery; but were we advancing in the moral sense? Some of our leaders sometimes seemed rather lacking in tolerance, which was the ultimate reward of education. Sir Alfred Webb-Johnson, P.R.C.S., named Hunter and Harvey as the founders of British medicine. Hunter's claim to fame was his encouragement of the experimental method.

X-ray Advisory Committee for the Colonies

The National Association for the Prevention of Tuberculosis has formed a special committee to advise on X-ray methods and apparatus in the British colonies. The chairman is Dr. R. R. Trail, and the members are Dr. J. M. Cruickshank (representing the Colonial Office), Mr. J. T. Ferrier, Dr. A. Stephen Hall, and Dr. Harley Williams (secretary).

British Spas Federation

Lord Horder presided over the annual meeting of the federation at Harrogate on May 9, when members sent a telegram to the Minister of Health expressing their wish to play their part in the treatment of rheumatism and allied diseases in the National Health Service. In his reply, Mr. Bevan said that he hoped to develop diagnostic and research centres associated with the major hospitals. "The precise relationship of the spas to these facilities," his message ended, "will need careful working out, but the subject is very much in my mind, and I am glad to take note of the federation's desire to be coöperative."

Returning Thanks

In recognition of the work of doctors from Durham City and the neighbourhood at the railway disaster at Browney Colliery last January, the divisional general manager of the London and North Eastern Railway has sent a cheque for 50 guineas to the treasurer of the Royal Medical Benevolent Fund. Another cheque for 50 guineas has been sent to the Durham County Hospital in recognition of the services of the medical and nursing staffs.

Rehabilitation of Displaced Persons

In the course of a Chadwick lecture delivered in London on May 7, Major Eyre Carter said that the plans for displaced persons in Europe were based on three cardinal principles —speed, orderliness, and welfare. The speed exceeded the most optimistic expectations. In May and June, 1945, Western displaced persons were returning by truck, train, and aeroplane, at the rate of over 40,000 a day. This disturbed the welfare arrangements, except for the basic requirements of food, which was obtained from Army stocks, and delousing, which was done with D.D.T. powder so effectively that it prevented the importation of typhus into western Europe. A million or more Jews, Poles, Yugoslavs, and Balts have yet to be repatriated or resettled; this problem is political rather than administrative, and it would be rash to prophesy when it will be solved.

Heberden Society

A general meeting will be held at 11, Chandos Street, London, W.1, on May 31, at 5.30 P.M. Mr. H. Jackson Burrows and Dr. George Graham will speak on Spinal Osteoporosis of Unknown Origin.

Association of Port Health Authorities

The 47th annual meeting of the association will be held at the City Chambers, Edinburgh, from May 28 to 30. Among the speakers will be Dr. M. T. Morgan, who will read a paper on Some Aspects of the Control of Smallpox, and Dr. W. P. Cargill, who will talk on Developments in Disinfestation.

Continental Surgeons' Visit

For the delegation of seven Belgian and six French surgeons who attended the conference of the Association of Surgeons in London on May 7–8 the British Council has arranged a tour ending on May 24. Arrangements have been made at Manchester by Prof. Harry Platt, at Oxford by Prof. Hugh Cairns, and at Edinburgh by Prof. J. R. Learmonth.

Air Vice-Marshal Kenneth Biggs has been appointed an honorary physician to the King.

Dr. Peter Reid has been appointed chief medical officer to the UNRRA mission in Czechoslovakia. Dr. Reid, who spent many years as chief medical officer to oilfields in Peru and Iraq, has been released from the R.A.M.C. to take up his new post.

The Central Medical War Committee announces that Dr. S. Charles Lewsen has resumed civilian practice at 83, Wimpole Street, W.1.

Sir Hubert Henderson has been appointed chairman of the Royal Commission on Population in succession to Lord Simon, who has resigned.

The publication of *Rheumatism*, interrupted by the war, has now been resumed with an issue for April. This quarterly journal is distributed for the Charterhouse Rheumatism Clinic by the Rolls Publishing Co., Ltd., 2, Breams Buildings, London, E.C.4.

Mme. Dora Rubin would like to get in touch with the two British doctors whom she met in the summer of 1940 while taking clothes, food, and medical supplies to the Prisoners of War British Hospital St. Raphael in Lille. Her address is 22 rue de Finisterre, Brussels, Belgium.

The amalgamation of two firms of surgical instrument manufacturers, Messrs. Down Bros. and Messrs. Mayer & Phelps, has been announced. The personal managements remain as heretofore.

Births, Marriages, and Deaths

BIRTHS

DANCKWERTS.—On May 8, at South Hayling Island, the wife of Captain Richard Danckwerts, R.A.M.C.—a daughter.

EDWARDS.—On April 30, at Leamington Spa, the wife of Lieut.-Colonel G. F. Edwards, M.B.E., R.A.M.C.—a daughter.

HARTLEY.—On May 7, at Rye, the wife of Dr. J. L. Hartley—a daughter.

JORDAN.—On May 4, at Oxford, the wife of Colonel A. Jordan, R.A.M.C.—a son.

KING.—On May 3, at Wellington, New Zealand, the wife of Dr. A. S. King (formerly of Balmore, West Newport, Fife)—a son.

LAUGHLIN.—On May 9, the wife of Dr. John Laughlin—a son.

MILLER.—On May 6, at Grantown-on-Spey, the wife of Dr. R. A. Miller—a daughter.

O'HIGGINS.—On April 17, in Dublin, the wife of Dr. P. O'Higgins —a son.

RENDALL.—On May 7, at Abingdon, Berks, the wife of Dr. D. C. S. Rendall—a son.

ROLLASON.—On May 5, at Weston-super-Mare, the wife of Flight Lieutenant W. N. Rollason, M.B., R.A.F.V.R.—a son.

SUCHET.—On May 2, in London, the wife of Lieutenant Jack Suchet, R.A.M.C.—a son.

WOODGATE-JONES.—On May 7, in London, the wife of Dr. N. P. Woodgate-Jones—a daughter.

MARRIAGES

CURRIE—GARLAND.—On May 4, at Richmond, Surrey, Donald Currie, major I.M.S./I.A.M.C., to Ysobel Marian Garland.

DEATHS

BEST.—On May 7, at St. Ives, Cornwall, William Harris Best, M.R.C.P., aged 80.

CARPENTER.—On May 7, Hayward Carpenter, M.B. Lond., of Ryde, Isle of Wight, aged 54.

COUNSELL.—On May 4, at Oxford, Herbert Edward Counsell, M.A. Oxfd, F.R.C.S., aged 82.

WESSON.—On May 8, in London, Arthur Sewell Wesson, M.D. Lond., F.R.C.P., F.R.C.S., aged 41.

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MEDICAL ADMINISTRATION AS A CAREER

J. M. MACKINTOSH
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PROFESSOR OF PUBLIC HEALTH IN THE UNIVERSITY OF LONDON; DEAN OF THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

THE field of administrative medicine has been progressively enlarged since the beginning of the present century. On the one hand, the remarkable growth in the number of institutions for the care of the sick, enriched in 1929 by the transfer of poor-law hospitals to the major health authorities, offers wide scope for medical administrators; and on the other, the immense expansion of the public-health services during the same period has created an increasing demand for administrative training and experience on part of health officers.

The evolution of a National Health Service, outlined in the Bill now before Parliament, will inevitably foster the demand for medical administrators under the regional hospital system. There will no doubt be some alteration of balance between the requirements of the hospital and of the public-health services, but the total need will expand. In planning for the future we should contemplate the development of hospital administrative schemes covering wide areas, and accept as a corollary the academic duty of training medical men and women in the principles and practice of administration.

In the new health services there will be great scope for trained lay administrators. This has been foreseen, and excellent courses of instruction in public administration have already been established for the benefit of the layman. Nevertheless, there is need for more specific training for lay administrators in the important subject of institutional management, and we must consider the possibilities of joint courses of training and apprenticeship. It has been argued with force that the best way to encourage people to work together at the same job is to train them together, in order that they may understand one another's problems and points of view. There is a strong case for providing a common basic training for all types of institutional administrator.

Hitherto the need for training medical men and women in administrative medicine has not been fully recognised, and doctors whose interests are mainly clinical have been slow to appreciate the value of administrative medicine or to realise that it is a proper and worthy career for medical practitioners whose talents lie in that direction. It is not surprising, therefore, that some controversy has arisen from time to time over the respective spheres of medical and lay administration, largely because the scope of the former has not been defined with sufficient precision to enable courses for instruction to be undertaken.

SCOPE OF MEDICAL ADMINISTRATION

Medical administration extends into many fields, including institutions for the sick, the public-health services, the growing social services, and the organisation of the medical profession itself under the new national proposals. Some of these divisions obviously require special practical training and experience which no academic course can provide—and this reservation is equally true of training for any profession. It follows that a considerable part of the training course must be of the nature of a practical apprenticeship. There are certain basic principles, however, and certain essential subjects of study which must be expounded by the academic teacher and practised under "laboratory" conditions. These are common ground for postgraduate students in public health, industrial medicine, and institutional administration, whether the student intends to make his career at home or abroad, in an institution or in the field. They should be the foundations upon which the graduate student can build his experience in any department of administration. It would be unreasonable to expect a medical undergraduate who is undergoing a difficult and prolonged training to fit himself for medical practice to acquire, without special training and experience, the qualifications expected of the administrator. This proposition would by no means justify the defeatist conclusion that medical administration is not a proper study for the medical man. On the contrary, the right deduction to be drawn is that, just as special training and practical experience are essential for the surgeon, the radiologist, the bacteriologist, or the ophthalmologist, so they are required for the medical administrator. Such courses of training should be provided forthwith for medical practitioners who wish to take up a career in administrative medicine. The ordinary medical curriculum is the foundation upon which many careers are built. It is a good foundation, and the proposals recently put forward by the Goodenough Committee will still further strengthen it to bear the structure of a sound postgraduate course in administration.

Administrative ability may be a quality of mind which is inherent, but it must be developed by training and practical experience. No two organisations are identical. Even where they are closely similar, each has generally an administrative tradition of its own, and the human relationships are infinitely varied. Medical administration, like medicine itself, must have a humanistic as well as a scientific approach. Moreover, the experience of one type of institution is of only limited value when a man is transferred to another, and even the most experienced administrator must tread warily in a new post. It follows that what we must try to teach the student is not so much a system as a series of principles. In the end his success as an administrator will depend on his personal qualities and his wisdom, but the teacher can smooth his path at the beginning, spare him some of the mistakes and embarrassments by which many have had to learn, and give him a background of sound knowledge of method, and of the structure of the health services in this country.

Medical and lay administration ought not to be in conflict with each other: they are complementary, and both are necessary. A hospital, for example, is primarily an institution devoted to the care of the sick, and its object is to restore them to health. The work of the medical administrator is to coördinate the services of a group of highly specialised medical scientists and other experts whose function coincides with that of the institution as a whole. This demands an appreciation of the needs of such a service which can best be achieved by a man with basic medical training. It is true that medical men tend to be highly individualistic in their outlook. There is no reason to suspect that this is a congenital defect; it is probably due in part to faults in the medical curriculum, and partly to the well-known "isolation" of the general practitioner, which the new National Health Service will do much to alleviate.

The hospital is, in addition, a business organisation. Its daily task in the modern community presents innumerable problems requiring business management, such as personnel supervision, maintenance of equipment and apparatus, purchasing, catering, food service, domestic work, finance, and public relations. These problems offer abundant scope for the lay administrator. There is constant need, for example, for skilled internal control of the hospital's activities through an efficient accounting system, including costing and administrative records. Quite apart from the professional staff every

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sizable hospital has an army of technical and domestic workers, and all the organisation of a large hotel. Wage policies have to be decided; food has to be cooked and served to the satisfaction of residents and guests (many of the latter being involuntarily much more difficult about their diet than the average hotel guest); and non-professional "bedroom service" has to be given to an extent far greater than in the most luxurious hotel. It is a fantastic anomaly that routine service of a domestic kind should have devolved upon trained nurses or even nurses in training. It would be equally wrong for day-to-day catering, purchasing, accountancy, and general management to be undertaken by a medical man. On the other hand hygiene in its broadest sense—the health of the hospital and its inmates—is clearly a medical function and should not be delegated to the layman. This includes medical equipment and services, the organisation of professional staff for team-work, and of the various departments in which they work, the devotion of the hospital to its primary function of making the sick whole, and of bringing comfort to those who are anxious and distressed, whether they be patients or their relatives. It includes the continuous supervision of the wards, the special departments, and (even more particularly) the outpatient services, as places where people are made welcome and comfortable. The function of the medical administrator is to adapt the hospital to the needs of the sick, not the sick to the traditions of the hospital.

FUNCTIONS AND STATUS OF THE ADMINISTRATIVE MEDICAL OFFICER

I do not propose to discuss in detail the duties of an administrative medical officer (A.M.O.). This would involve an exhaustive account of hospital and general public administration. The immediate point is to gain a clear idea of what we ought to teach a medical officer and, by way of contrast, what a layman should be taught, in order to achieve the object of securing a good administrative team. The relationship of the A.M.O. to the governing body of a hospital is legally that of "servant and master," with all that this implies. But the hospital is a special type of organisation and cannot be efficiently and sympathetically run on purely business lines; for that reason the A.M.O. should be regarded as a kind of executive partner in the enterprise—much like the dean of a medical school—without a vote, but with a right to be present at all meetings of the board and its committees, to take part in all discussions, and to advise freely on policy. One of his main functions is to interpret the medical and professional point of view to the layman. He is responsible to the board for the professional standing of the hospital, for good will in its public relations, for efficiency in its medical equipment and services, and above all for the well-being and comfort of patients and their friends. He should also be ultimately responsible for the maintenance of medical records, the follow-up of discharged patients, and the whole complex of medical-social relations which have now become such a vital part of the good hospital. The medical side of public relations with other hospitals and with the regional centre would form an important part of his duties.

Large hospitals would of course have an A.M.O. of their own; and teaching hospitals would no doubt require deputies and assistants. In smaller units it would not be possible or desirable to appoint a whole-time A.M.O. for each institution; a lay administrator would be more appropriate for day-to-day management. The same considerations apply to other specialists, who would be appointed to a group of small units. If we take the right view of modern hospital administration, the first essential is to understand that *the administrative medical officer is a specialist in his own sphere.*

The A.M.O. would also be charged with the duty of interpreting the problems of the lay administrator to the medical staff. It is suggested that he should be a member of the medical committee of the hospital or group of hospitals, with all the rights of membership but no rights ex officio. He would be able, as a matter of course, to guide the medical committee in administrative questions—as representing his specialty—but only to the same extent as the senior surgeon would guide them on surgical matters. Assuming that the medical staff was represented on the hospital management committee the A.M.O. would have no special duty to present its decisions. His duty to the board would be to point out the medical administrative implications of these decisions, just as it would be the function of the lay administrator to explain their effect from the point of view of his office.

CAREER OF AN ADMINISTRATIVE MEDICAL OFFICER IN THE HOSPITAL SERVICE

After registration the doctor aspiring to an administrative career would do well to serve as an assistant in general practice for at least a year. Thereafter he would probably take up a post as senior resident, with administrative duties, in one of the smaller hospitals within a regional group. While undertaking this, or other work (e.g., with a health authority), he would be given facilities for taking the course for the "diploma in medical administration" just in the same way as many young men are given the opportunity of taking the diploma in public health. On securing his diploma, after one year of academic study and one year of supervised "apprenticeship," he would qualify for a recognised administrative post of junior grade, either within the hospital service, or in the field of public health or industrial medicine, according to his inclination. The next step might be to become a deputy A.M.O. in a large hospital, perhaps at the same time acting as a visiting junior specialist to a group of smaller hospitals in the region. His final promotion would be either to a teaching hospital or to the headquarters of a region.

TRAINING OF AN ADMINISTRATIVE MEDICAL OFFICER

At the present time the only course of training in this country dealing with medical administration is the post-graduate course for the diploma in public health. The greater part of this course, although it has been broadened by the regulations recently introduced by the General Medical Council, is not well adapted to training in general medical administration and does not give practical experience in hospital administration. It has the additional disadvantage from this point of view that it is a statutory qualification; it is therefore necessarily somewhat rigid in its requirements. In the United States, on the other hand, the course of training for the qualification in public health is much more elastic. It consists of certain essential subjects, but the candidate has a wide choice beyond these, according to his bent. Under the heading of elective subjects he may specialise in administration, or statistics, or a considerable variety of other subjects—all within the fold of his diploma course.

Other forms of training are sometimes undertaken by medical men in England, such as the diploma in public administration, the Bar, or the teaching profession; but none of these is really specific enough for the purpose in view. A recognised course of academic training, followed by practical experience through an apprenticeship system, should be introduced, leading to a diploma in medical administration at the end of two years. It should be noted in passing that the term used above is wider than "hospital administration"; and it is right that the diploma should cover a more extensive field of study and practice.

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ACUTE BENIGN DRY PLEURISY
IN THE MIDDLE EAST

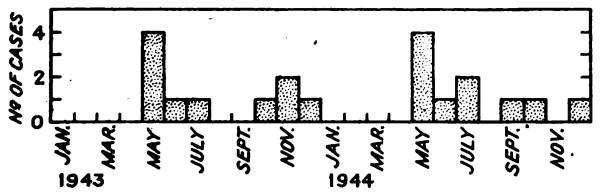
J. G. SCADDING
M.D. Lond., F.R.C.P.

ASSISTANT PHYSICIAN TO BROMPTON HOSPITAL, LONDON; PHYSICIAN AND SENIOR LECTURER IN MEDICINE, BRITISH POST-GRADUATE MEDICAL SCHOOL; LATE LIEUT.-COLONEL R.A.M.C.

IN 1943 and 1944 cases of an acute febrile illness, characterised by evidence of dry basal and diaphragmatic pleurisy and following a uniformly benign course, were observed at a general hospital in the Suez Canal area. They resembled the maladies described by Sylvest (1934) and others as "Bornholm disease," "epidemic myalgia," "epidemic myositis," "epidemic pleurodynia," and "devil's grip," but differed from most of them in several important respects, especially in the common occurrence of unmistakable signs of gross dry pleurisy. This paper presents a clinical description of these cases, with a review of the relevant literature, especially that which has appeared since the publication of Sylvest's monograph on "Bornholm disease" in 1934.

CLINICAL PICTURE

Incidence.—The first case was observed in May, 1943; the incidence was maximal in May and June, and then fell away until the end of the year. No case was seen from January to April, 1944; but the illness appeared again in May, 1944, and continued sporadically until December, 1944. No case had been seen in 1945 by the end of July, when I left the Middle East. The exact total incidence is difficult to assess, as many of the cases were treated in minor medical wards, and some may have been given non-committal labels by the officers in charge. For this reason this paper is based upon the notes of those treated in the officers' ward, which was under my direct care. In the two years, 20 cases which I regarded as belonging to this group were treated in this ward. The monthly incidence is shown in the accompanying figure. The malady seemed to be of more



Monthly admissions of officers with acute benign dry pleurisy to a military hospital in the Middle East.

common incidence among officers than among other ranks, for in 1943, when 10 cases were seen in the officers' ward, the number seen in the other ranks' wards was estimated to be about 40; and the usual ratio of numbers of admissions of officers and other ranks for all diseases was between 1 : 10 and 1 : 15. This heavier incidence among officers is of the same order as that observed with infective hepatitis both at the same hospital and elsewhere in M.E.; and it is interesting to note that McDaniel (1944) in an outbreak of "epidemic diaphragmatic pleurodynia" among U.S. naval personnel observed two-thirds of the cases in officers.

The cases arose in units scattered over the rather extensive area served by the hospital, and in only one instance was there a significant number at the same time from one unit. This was in May, 1944, when 3 patients came from one small rather isolated unit.

Prodromata.—Prodromal symptoms were rare. In 3 there was a history of mild coryza, three, ten, and fourteen days before the onset of more definite symptoms. In 1 there had been a succession of infected insect bites and boils for about a month.

Onset.—The onset was usually sudden, and in 18 of the 20 cases the first definite symptom was pain. In 5 the initial pain was epigastric or across the upper abdomen; in 6 it was pleuritic in character on the right or left side; in 2 it was described as constant and across the chest; in 4 it was situated in the region of the costal margins; and in 1 it was referred to the left shoulder. In only 2 cases the first symptoms were general malaise and fever; in both of these the pleuritic pain followed, in a few hours in one, and in two days in the other. In only 1 case was there a slight rigor at the onset. In most cases there were headache and other febrile symptoms soon after the onset of pain.

The pain was the principal symptom. Its total duration varied from three to twenty days, with a mean of 10·7 days. It was entirely confined to the chest, abdomen, and shoulder, situations in which it could reasonably be attributed to a pleural origin, except in 2 cases; in these there was, besides the apparently pleural pain, transient pain in muscles elsewhere—in the lumbar region on the first day in one, and in the lumbar and dorsal muscles on the fifth day in the other. In 6 cases there were remissions and recurrences of pain; generally in these the first attack of pain lasted only one or two days and was followed after a remission lasting from two to four days by a more severe recurrence, which might be in a different site from the first attack. In 2 cases pain contralateral to the initial pain appeared two and three days after the original onset.

When fully developed, the pain was pleuritic in character, being aggravated by respiratory effort, no matter what its site, though at the onset it was often described as constant and aching. Its severity varied greatly. In a few cases the initial pain was very severe, causing rapid shallow breathing and suggesting the onset of a pneumococcal lobar pneumonia. In fact, 7 patients were treated with sulphonamides at the onset with this provisional diagnosis. As soon as the diagnosis became clear, this treatment was stopped; hence only very small amounts of sulphonamide drugs, varying from 7 to 14 g., were administered. In others the onset with severe abdominal pain suggested acute abdominal conditions; diagnoses in 2 cases on admission were acute appendicitis and acute cholecystitis.

The final distribution of the pain in the 20 cases was as follows:—

	Cases
Right side of chest only	7
Right side of chest and right shoulder	1
Right side of chest and right iliac fossa	1
Both sides of chest: right, then left	1
Both sides of chest: left, then right	1
Left side of chest and epigastrium	3
Left side of chest, epigastrium, and left shoulder	1
Left side of chest and left shoulder	1
Right and left costal margins	2
Both costal margins, left iliac fossa, and right hypochondrium	1
Right costal margin, both shoulders, and epigastrium	1

The chest pain was always felt over the lower ribs, usually in the side but sometimes at the back.

Pyrexia.—The mean duration of pyrexia after admission to hospital was two days; 3 patients had no pyrexia while in hospital but gave histories of febrile symptoms before admission. Since the mean duration of symptoms before admission was 2·9 days, it seems likely that the mean duration of pyrexia from the onset was between four and five days. The highest temperature recorded varied from 99·2° to 104° F, with a mean of 101·2° F. No very distinctive type of fever-curve was detected. The pulse-rate was generally in proportion to the temperature.

Catarrhal symptoms were rare. There was no evidence of pharyngitis; 7 patients admitted to dry cough, and 2 to a slightly productive one, attributed, probably correctly, to smoking.

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PHYSICAL SIGNS

In a few cases no very distinctive physical signs were ever found; but in most cases pleural friction, cutaneous hyperæsthesia on the trunk, or abdominal tenderness was detected during the course of the disease. No tenderness or swelling of muscles, such as was observed by Sylvest in some cases of "Bornholm disease," was observed.

Pleural friction was found in 11 cases: in 3 on the right side only, in 3 on the left, and in 5 on both sides. The time of its first appearance varied from three to nine days after the onset of symptoms. In cases in which it appeared on both sides it was unilateral at first and was detected on the second side from one to six days after its appearance on the first side. The friction was always localised over the extreme base of the lung, and sometimes to quite a small area. It soon became very coarse in most cases, and in 5 it became palpable, in 1 bilaterally. It often appeared after the most severe pain had abated, and sometimes persisted after the actual pain had disappeared; a few patients who still showed gross or palpable friction felt quite well, with only a slight dragging sensation on deep inspiration; 3 patients with bilateral friction had no pain on the side on which the second friction-sound appeared. Friction remained detectable from two to eighteen days.

Cutaneous hyperæsthesia was noted in 8 cases; 5 of these showed pleural friction also. The hyperæsthesia was referred to segmental areas of the anterior abdominal wall, more rarely of the flanks, and never to the back. It was generally confined to areas supplied by one or more of the nerves D9–D11, though in 2 cases it extended down to the groin. It was superficial, being elicited best by stroking with a pin. Sometimes the sensitivity to this procedure was intense. In 4 cases the hyperæsthesia was confined to the right side of the abdominal wall, and in 4 it was present on both sides. It was first detected from one to ten days after the onset, and it lasted for a variable time up to a maximum of fourteen days.

Abdominal tenderness was elicited in 6 cases: in the right hypochondrium in 3; in the right iliac fossa in 1; over the whole upper abdomen, pressure in this region causing pain in the right shoulder, in 1; and in the right hypochondrium and right renal angle in 1. These abdominal signs were predominantly right-sided, whereas pleural friction was observed with equal frequency on the two sides.

X-RAY AND BLOOD FINDINGS

Radiographic examinations were made in 18 cases at various times from the third to the twenty-sixth day from the onset. Films were taken in 15 of these: all showed normal lung-fields and normal levels and contours of the diaphragms. Fluoroscopy was carried out in 16; only 2 of these examinations, both on the seventh day, showed very slightly restricted movement of the diaphragm on the affected side, and the rest showed no abnormality.

Leucocyte-counts.—Sixteen leucocyte-counts were done in 14 cases, from the first to the eighth day. Total and differential counts were within the limits of normal, except for two on the first day, which showed respectively 12,150 per c.mm. with 90% neutrophils, and 10,200 per c.mm. with 88% neutrophils, and one on the third day which showed 2000 per c.mm. with 24% neutrophils. In this last case the count rose to a normal level (7350 per c.mm. with 48% neutrophils) by the seventh day without special treatment.

Erythrocyte-sedimentation rate (Westergren) in 1 case on the seventh day, when gross palpable pleural fremitus was present, was 2 mm. in the first hour. In another, with bilateral pleural friction, it was 70 mm. on the fourth day and fell to 13 mm. by the sixteenth day.

The duration of hospital treatment varied from three to thirty-two days, with a mean of 15·2 days. All patients were symptom-free on discharge.

DIFFERENTIAL DIAGNOSIS

At the onset, as has been mentioned, the question of differential diagnosis from various forms of *pneumonia* and *abdominal emergencies* occasionally arose, but it became less difficult to decide as the clinical picture of the malady became familiar. *Tuberculous pleurisy* was excluded by the absence of effusion and by the normal lung radiograms. The only other diagnostic difficulty arose in a few cases with right-sided symptoms, in which the possibility of *amœbic hepatitis* had to be considered. This also was resolved by the course of the illness and by negative results to appropriate investigations when indicated.

COMPARISON WITH "BORNHOLM DISEASE"

Whether or no the outbreaks which have been described as "epidemic myalgia" or "Bornholm disease," "epidemic pleurodynia," "epidemic transient diaphragmatic spasm," and "epidemic pleurisy" were ætiologically related to each other must remain an open question. All efforts to classify them ætiologically have failed.

Cooper and Keller (1937) and MacDonald et al. (1937) reported attempts to isolate a causal organism from patients in an epidemic in Cincinnati in 1935; bacteriological studies were negative, apart from the constant presence of a green-producing slightly hæmolytic streptococcus growing in tiny colonies in cultures from throat swabs and nasal washings, and all attempts to transmit the disease to animals with this organism, with nasal washings or with Seitz filtrates of them, failed. They noted that there was concurrently in the vicinity of this outbreak an epidemic of benign lymphocytic meningitis.

McConnell (1945) observed an "epidemic of pleurodynia" among student nurses and failed to infect hamsters, mice, guineapigs, and chick embryos with blood, cerebrospinal fluid, nasal washings, and urine from the patients; complement-fixation tests for antibodies to the viruses of influenza and lymphocytic choriomeningitis were negative.

Crone and Chapman (1933) reported failure to infect a human volunteer by injection of 10 c.cm. of whole blood from a patient on the fourth day of "epidemic pleurodynia."

Small (1924) claimed to have found inclusion bodies which he interpreted as a causal plasmodium in the erythrocytes of patients with "epidemic pleurodynia," but this observation has not been confirmed by other workers.

Thus, in this group of diseases only a clinical classification is possible. Examination of published records of outbreaks shows that the common features accepted as warranting classification in this group are occurrence in epidemic or endemic form; a sudden onset with severe pain in the lower chest, abdomen, and sometimes shoulder-region; a brief but sometimes recrudescent febrile course to complete recovery; and absence of evidence of an underlying pulmonary lesion. On these criteria the cases here reported must be accepted as belonging to this group, but they differ in several respects from other recorded series, as do these among themselves.

Epidemicity.—Many recorded epidemics have taken the form of local epidemics, sometimes locally recurrent. In Scandinavia the disorder has received various local names, such as "Bornholm," "Skien," "Bamble," or "Drangedal" disease, but it may also be distributed sporadically (Sylvest 1934).

High incidence in members of one household has been reported (Sylvest 1934, Payne and Armstrong 1923), and even in one household without a widespread epidemic in the locality (Pickles 1933, Howard 1938). Localised outbreaks have occurred in schools and colleges (Attlee et al. 1924, Carter 1933, Locke and Farnsworth 1936, Glover cited by Pickles 1937); in military units (Akel 1944); on warships

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(Huss 1934); on small islands (Sylvest 1934, McDaniel 1944); in hospitals and convalescent homes (Williamson 1924, Lloyd 1924, Welborn 1936, McConnell 1945); and in orphanages (Greene 1924, Vuillet 1935). The outbreak described by Vuillet was apparently confined to boys of a Paris orphanage, no cases being observed outside this institution. In some of these localised outbreaks the case-incidence among those at risk has been high; for example, 34% of the personnel of two ships (Huss 1934), 39% of the girls in a school (Glover cited by Pickles 1937), and 15% of the students in a college (Locke and Farnsworth 1936), all in short outbreaks.

On the other hand, some reports indicate that the disease has smouldered on over a wider area for a longer period.

According to Sylvest (1934) "Bornholm disease" has appeared sporadically throughout Denmark, with local outbreaks from time to time, and with a maximal incidence between July and October each year. Huss (1934) reported a similar state of affairs in Sweden in the years 1929–31.

The occurrence of probable outbreaks of illnesses of this sort up to 1934 in Scandinavia and elsewhere has been reviewed by Sylvest (1934). Since that date outbreaks extending over a wide area have been reported from Victoria, Australia (Doig 1937), and from several areas in the United States: Boston (Rector 1935, Richter and Levine 1934), Ohio (Harder 1936), Cincinnati (MacDonald et al. 1937), and Brooklyn (Howard et al. 1943).

Seasonal Incidence.—All these local outbreaks occurred in the summer and early autumn months, including those in the Antipodes, which occurred in December (Doig 1937) and from February to April (Akel 1944). The seasonal incidence of the cases in the present series approximated to the type reported by Sylvest in Denmark, but the peak was reached rather earlier in the year.

Prodromata.—A significant incidence of prodromata was seen in the outbreak described by Attlee et al. (1924), who stated that sore throat preceded the onset of the pain in many of their cases; Welborn (1936) described 4 out of 11 cases as showing vague prodromal malaise for several days; McDaniel (1944) found prodromal malaise for twenty-four hours usual; Akel (1944) reported pharyngitis in 8 out of 27 cases; and MacDonald et al. (1937) found sore throat in 15% of their cases. Other observers of outbreaks either stated that prodromata were rare or did not mention them. Locke and Farnsworth (1936) observed very mild prodromal symptoms in only 5 out of 121 cases.

Onset of symptoms has usually been stated to be sudden with pain, as in the present series. Rigors, which were not observed in the present series, were stated by Sylvest (1934) to be rare, and by Harder (1936) to have occurred in 7 out of 282 cases.

The *site of the pain* was in general similar to that found in the present series. Sylvest (1934), however, found pain and tenderness in muscles of the trunk and limbs in many of his 93 cases, and palpable changes in the abdominal, erector spinæ, pectoralis, trapezius, biceps, or calf muscles in 13 of them. He regarded these observations as evidence in favour of his view that the disease primarily involved the muscles; but Welborn (1936) reported that a biopsy from a tender latissimus dorsi muscle in a case of "epidemic pleurodynia" showed no abnormality. Locke and Farnsworth (1936) found that the pain was variable in site from case to case, and in the same case from time to time, but was always related to "anything which causes movement of the diaphragm."

A recrudescent course has been a frequent finding in most outbreaks. In Sylvest's (1934) series of 93 cases, 27 showed "exacerbations." There was a recurrence of pain with a secondary rise of temperature in 13 out of 70 patients studied by MacDonald et al. (1937). In the 121 cases of Locke and Farnsworth (1936) 63% showed from one to three recrudescences. In the present series 6 out of the 20 patients showed one or more definite recrudescences of pain; but on the whole the course seems to have been rather more protracted and the remissions, when observed, less clear-cut than in other recorded series.

Pleural Friction.—The incidence of pleural friction has varied greatly from outbreak to outbreak.

Sylvest (1934) mentioned pleurisy as a complication of "epidemic myalgia" and observed it in 2 of his 93 cases. Reviewing the previous literature, he noted that, in the 1896 epidemic of "Skien disease" in Scandinavia, Bacher had estimated that pleural friction was reported in about 1 case in 10; Thjotta and Salvesen in 1923, also in Norway, found it in 3 out of 44 cases; Kerppola, in an epidemic in Helsingfors in 1930, found it in 28 out of 120 cases; but, on the other hand, Josephson in Sweden detected no pleural friction among 87 patients.

In the outbreak in England in 1924, which in other respects seems to have been similar to the Scandinavian ones, pleural friction, often coarse and loud, was frequent: Lloyd (1924) recorded it in 4 out of 5; Williamson (1924) in 7 out of 13; and Attlee et al. (1924) in 17 out of 48 cases, noting that some patients felt or heard a creak long after acute pain had disappeared.

Locke and Farnsworth (1936) described "fibrinous pleuritis" as a "complication" in 17 of their 121 cases; in most of these the friction was very coarse and intense and heard over a wide area, and in some it was palpable and could be felt by the patient. Radiography repeatedly failed to demonstrate any effusion.

Other authors found pleural rubs in a varying proportion of cases. Heckscher (1933) observed 11 cases of "myositis epidemica" in a Copenhagen military hospital and found pleural rubs in 5, bilateral in 1. In Sweden Huss (1934) reported pleural friction in about 20 out of 884 cases, and Lindberg (1936) in 1 out of 81 cases in children. In England Glover (cited by Pickles 1937) found pleural friction in 2 out of 79 schoolgirls with "Bornholm disease."

In the United States the finding of a pleural rub in such cases has been reported by Churchill et al. (1926) in 1 out of 50; by Crone and Chapman (1933) in 2 out of 30; by Richter and Levine (1934) in 1 out of 24; by Harder (1936) in 2 out of 282; and by Howard et al. (1943) in 3 out of 166. In France Vuillet (1935) detected 1 case with a soft transient rub in an epidemic in an orphanage.

Pleural friction was either stated never to have been heard in cases belonging to this group, or not mentioned, by Payne and Armstrong (1923) in a large epidemic in Virginia; Hanger et al. (1923) in 16 cases in New York; Torrey (1924) reporting 4 cases in Philadelphia; Rector (1935) in 19 children in Boston; MacDonald et al. (1937) in 282 cases in Cincinnati; McConnell (1945) in 16 cases in Pennsylvania; Howard (1938) in 5 cases in England; Doig (1937) in an outbreak in Victoria, Australia; and McDaniel (1934) in 25 cases on a Caribbean island.

Pleural friction thus seems to have been the most variable feature in different outbreaks otherwise presenting a fairly uniform clinical picture.

Cutaneous Hyperæsthesia.—Sylvest (1934) stated that there was no hyperalgesia or disturbance in the sensibility of the skin corresponding to the tender areas in the patients he examined for such phenomena, and that it was the muscles which were sore. Locke and Farnsworth (1936), on the other hand, described "referred pains" on the trunk, especially across the lower or lateral abdomen, lower back, along the upper border of the trapezius muscle, side of neck, upper front of chest, and top of shoulder; and stated that over these areas the skin showed a varying degree of hyperæsthesia, but that there was never more than slight muscle tenderness. They noted that these areas were similar to those mapped out by Capps (1932) in his experimental studies of referred pain induced by irritation of the diaphragmatic pleura.

Pericarditis, orchitis, and meningo-encephalitis have been reported as additional manifestations in a few patients in some epidemics which otherwise presented the usual picture of "Bornholm disease." None of these was observed in the present series.

Sylvest (1934) saw neither pericarditis nor nervous system involvement in his 93 cases. He stated that *pericarditis* was observed "a few times" in the "Skien disease" of 1896

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and among the cases in Copenhagen in 1932. Heckscher (1933) observed pericarditis once among 11 cases in Copenhagen. Locke and Farnsworth (1936) found evidence of pericarditis in 3 of their 121 cases; in 2 of these there were both symptoms and signs of pericarditis, appearing on the sixth and ninth days of illness, and in the other a loud pericardial rub, coincident with extensive pleurisy, was accompanied by no special symptoms.

Orchitis occurred in 1 case in Sylvest's (1934) series. Sylvest states that Bacher observed it in "Skien disease" in 1896, and quotes Petrén that at Malmo in 1931 there were about 25 cases of orchitis in connexion with "Bornholm disease." Huss (1934) states that in a series of 884 cases in Sweden about 50 had orchitis. Vuillet (1935) found 3 cases of orchitis in the outbreak of "epidemic myalgia" in a Paris orphanage.

Involvement of the central nervous system has been recorded in the form of *lymphocytic meningitis* or *meningo-encephalitis* following a benign course. Huss (1934) reported, among 884 cases, 1 of meningitis, appearing a week from the onset of the illness, with 1600 cells per c.mm. in the cerebrospinal fluid, and 1 of "ataxia" (unspecified), both recovering completely. Lindberg (1936) found 5 cases of meningitis among 81 of "epidemic myalgia" in children in Sweden; meningitic symptoms appeared between the third and fifth day of illness, and the meningitis ran a short benign course.

Howard et al. (1943) found among 166 cases of "epidemic pleurodynia," 5 adults and 1 child with meningo-encephalitis, characterised by headache, apathy, vertigo, photophobia, and neck-rigidity, with a pleocytosis, mainly lymphocytic, in the cerebrospinal fluid, following a benign and usually short course to complete recovery without sequelæ; in their series there were 8 infants under the age of two years, all of whom had convulsions, but they found a pleocytosis (of 73 cells per c.mm.) in the cerebrospinal fluid in only 1 of these.

Radiological Findings.—Observers who have made radiographic studies in cases of this group agree that no changes can be found in the appearance of the lungs at any stage.

Hanger et al. (1923), Richter and Levine (1934), and Crone and Chapman (1933) reported that on fluoroscopy they found the diaphragmatic movements normal. MacDonald et al. (1937) found that, though diaphragmatic movement was normal in 4 cases examined during convalescence, it was restricted on the affected side in 1 examined during the acute phase. These findings are in agreement with those made in the present series.

Leucocyte-counts.—Many of the reports on the leucocyte-count do not mention the day of the disease on which the counts were made, and thus it is difficult to correlate them with each other.

Typical figures are those of Richter and Levine (1934), who found in 24 cases a total leucocyte-count varying from 5300 to 17,300 per c.mm., with neutrophils varying from 65% to 94%. MacDonald et al. (1937) found a tendency to leucopenia from the second to the fifth day. Harder (1936) found that 2 out of 9 total leucocyte-counts were over 10,000 and of these 1 fell later to 3000 per c.mm.

These findings are comparable with those made in the present series, which suggest that the total leucocyte-count may be raised, at least to the upper limit of the normal range, at the beginning of the illness, and fall later.

COMMENT

In the M.E. cases the symptoms and signs suggested an infection causing dry basal and diaphragmatic pleurisy; there was little evidence of muscle-involvement, no complications developed, and the illness appeared as a mild local endemic rather than a sharp epidemic. The other outbreaks reviewed above obviously varied in the incidence of pleural friction, pericarditis, orchitis, and meningo-encephalitis; in the proportion of cases in which tenderness and objective changes in the muscles were detected; and in epidemiological type, some occurring in explosive epidemics in small communities, and others being more widely prevalent for longer periods.

Williams (1941) reported 5 cases of "epidemic myositis with neuritis, erythema, and meningeal symptoms," which had occurred at one R.A.F. station in the early summer of 1940. The muscular symptoms included "spontaneous pain and soreness, exquisite tenderness on light pressure or movement, weakness, an abnormally firm texture of the affected muscles, depression of deep reflexes, hyperæsthesia and œdema of the overlying skin"; and the trunk, limb-girdle, and proximal limb muscles were those principally affected. This type of muscle-involvement was noted by Sylvest (1934) in some cases of "Bornholm disease" but has not been reported in outbreaks of "epidemic pleurodynia" or "epidemic pleurisy" in Great Britain or America. The illness described by Williams differed also from all outbreaks reviewed above in the occurrence of transient symptoms of polyneuritis in 4 out of 5 cases, of an erythematous rash in 3, and of meningeal symptoms in all 5 (though changes in the cerebrospinal fluid were found in 3 only). This illness thus seems to be in a separate category; it certainly differed greatly from the "epidemic pleurisy" seen in England in 1924 (Williamson 1924, Lloyd 1924, Attlee et al. 1924) and from the present series.

That all these outbreaks are due to infection is strongly suggested by their occurrence in epidemics, each presenting cases with a recognisably similar febrile course, and by evidence in some instances of direct case-to-case transmission. That the infection is of a virus nature is suggested by the failure to demonstrate any constantly present bacterial agent, and by the occurrence, in a varying proportion of cases, of such manifestations as benign serous meningitis or meningo-encephalitis and orchitis, similar to those observed in several recognised virus infections. Whether these outbreaks are associated with one infecting agent, producing differing clinical and epidemiological pictures in differing circumstances of individual and community susceptibility, or with several distinct agents is, on present evidence, uncertain. Complete clinical description of them is important, both to ensure that they are distinguished from more serious disorders and because clinical recognition of an outbreak is an essential preliminary to investigation of the infecting agent or agents, whose isolation may lead to more satisfactory classification and nomenclature.

SUMMARY

An acute febrile illness characterised by symptoms and signs suggesting dry basal and diaphragmatic pleurisy, running a short benign course, was observed in a British military hospital in the Suez Canal area in 1943 and 1944. A clinical description of it, based on 20 cases, is given.

This illness bore a great resemblance to those which have been described under such names as "Bornholm disease," "epidemic pleurodynia," and "epidemic pleurisy." The relevant literature since 1934, when Sylvest's monograph summarised earlier publications on the subject, is reviewed.

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CLINICAL TRIALS OF KEMITHAL

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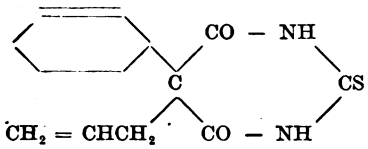
A NEW hypnotic drug was submitted to us by Carrington and Raventos of Imperial Chemical (Pharmaceuticals) Ltd. for clinical evaluation in 1940. This drug, 'Kemithal,' has the following construction :—



5-cyclohexanyl-5-allyl-2-thiobarbituric acid.

It is not soluble in water as the acid, but its sodium salt is readily soluble in water up to 20%. The sodium salt is a pale yellow, slightly hydroscopic powder, and its solutions are stable for 4–5 hours. The pH of its 10% solution is 11·2, a figure comparable to the 11·5 for hexobarbitone ('Evipan') and 10·6 for thiopentone ('Pentothal') solutions.

Carrington and Raventos [1] in their laboratory investigations of the pharmacology of kemithal considered that it is about half as potent as thiopentone and slightly less potent than hexobarbitone; but owing to its lower toxicity kemithal had a larger margin of safety. Equi-active doses of the three drugs produced a similar duration of action and onset of anæsthesia. In rabbits daily anæsthetic doses of kemithal for fourteen days did not produce any detectable histological changes. The drug is almost entirely destroyed in the body.

Carrington and Raventos stated that in equi-anæsthetic doses in animals kemithal causes about half the respiratory depression found with thiopentone.

We have now followed up 400 patients to whom we have given this drug either as the sole anæsthetic (50 cases) or as an induction agent to other anæsthetics. In both series of cases the operation ranged from dental extractions to abdominal operations.

What is of interest to the anæsthetist is whether, used in doses which afford equally satisfactory operating conditions, this drug produces a greater or lesser degree of respiratory depression and a higher or lower incidence of postoperative complications than other anæsthetics. Owing to the large number of variables in types of patient and operation it is impossible in the space of a few months to find anything approximating a series of parallel cases in which to test a new drug against a known one, but we here record our clinical impressions and postoperative observations following the use of kemithal in our cases. The ages of the patients ranged from 10 to 73 years; 50% of the patients were classified as "very fit," and the remainder varied, down to "very poor." The great majority of the patients received morphine gr. 1/6 and atropine gr. 1/100 before operation.

1. Carrington, H. C., Raventos, J. (1946) in the press.

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For some time we have been satisfied with the superiority of soluble thiopentone ('Pentothal Sodium') over any of the other ultra-short-acting barbiturates. In recording our impressions of kemithal we find that given in equi-active doses this drug and thiopentone have closely similar advantages and disadvantages as anæsthetics.

CLINICAL FINDINGS

Clinical experience supports the experimental findings that its potency is about half that of thiopentone, and the following remarks show that, in our view, in equi-active doses it would be difficult if not impossible to distinguish clinically between the two drugs.

Induction.—Perfect; occasionally slight muscular twitchings.

Respiratory Depression.—Given in doses to produce good muscular relaxation—e.g., when used as the sole anæsthetic for appendicectomy or herniotomy—it is our impression that the respiratory depression is not so pronounced as when other barbiturate preparations are used for this purpose.

Rate of Recovery.—In conformity with similar drugs the rate of recovery ranges from rapid (a few minutes) after small doses to prolonged (several hours) after large doses.

Venous Thrombosis.—Most of the injections were given as a 10% solution. In two of these cases thrombosis resulted, and also in the only patient to whom a 20% solution was given. Possibly other cases of thrombosis were overlooked.

Laryngeal Spasm.—In common with other barbiturates the sensitivity of the larynx is increased under light anæsthesia. If under light anæsthesia an attempt is made to insert an airway, intubate the larynx, or give strong ether vapour, a brisk laryngeal spasm results.

Postoperative Sedation.—The tendency to postoperative restlessness appears to be less than with other barbiturates. For example, three-quarters of the ward cases anæsthetised with kemithal only did not require any sedation; the remainder reacted well to morphine.

Nausea and Vomiting.—These were rare complications.

Blood-pressure.—Both the systolic and the diastolic pressures and the pulse pressure fall with administration, the intensity of the fall varying with the amount of kemithal administered.

Dosage.—The doses we administered ranged from 0·5 g. to 6·3 g. For a healthy adult undergoing appendicectomy who had been given morphine gr. 1/6 preoperatively it would be expected that 3–4 g. would be used. In our series there was one death, in a man aged 36 to whom 5 g. of kemithal was given as the sole anæsthetic for an extensive abdominal exploration, in a case of malignant papilloma of the rectum. Recovery from anæsthesia took 3¾ hours and appeared to be normal, but progress was not maintained and he gradually went downhill and died on the fifth day. Permission to carry out a postmortem examination was refused. In no other case was there any serious postoperative complication.

Electrocardiographic Changes.—In 12 cases electrocardiograms were taken before, during, and after anæsthesia, but no alteration of any significance was noted. A slight increase in pulse-rate was common.

Hæmoglobin.—No alteration of hæmoglobin percentage was found after anæsthesia in 12 cases examined.

Impairment of Liver Function.—In 12 cases extensive liver-function tests, based on the excretion of hippuric acid, and glucose-tolerance curves showed an impairment of liver function proportional to the amount of drug administered. This impairment was not detectable clinically and was only temporary. We have not carried out similar tests on patients anæsthetised with other anæsthetics.

Rectal Administration.—In 10 cases kemithal was given rectally and proved to be a satisfactory basal anæsthetic. For a healthy adult 3 mg. should be given in about 50–60 c.cm. of water about three-quarters of an hour before the operation.

SUMMARY

Clinical impressions of the use of kemithal, a new intravenous barbiturate anæsthetic, based on 400 cases are recorded. In equi-active doses its clinical actions closely resemble those of thiopentone ('Pentothal').

We thank Mr. J. R. P. O'Brien, B.SC., and Mr. G. Higgins, B.SC., of the department of biochemistry, Radcliffe Infirmary, for carrying out the liver-function tests; and Dr. J. L. Linacre for his help in estimating the value of this drug clinically.

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CLINICAL INVESTIGATION OF KEMITHAL

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'KEMITHAL' was elaborated in the laboratories of Imperial Chemical (Pharmaceuticals) Ltd. by Carrington and Raventos as a result of efforts to produce an ultra-short-acting barbiturate with a greater margin of safety and fewer disadvantages than other drugs in common use. After laboratory investigation it was given its first clinical trials by Prof. R. R. Macintosh and his colleagues in the Nuffield Department of Anæsthetics at Oxford. In May, 1944, we were given the opportunity to make a clinical trial of this drug, and the results here recorded are based on the use of the drug in routine anæsthesia for a year.

The chemistry and pharmacology of kemithal are fully described by Carrington and Raventos.[1] In chemical structure the drug is more closely related to hexobarbitone ('Evipan') than to thiopentone ('Pentothal'), so it might be expected to be a less potent anæsthetic than thiopentone. Such is the case, and the amounts of kemithal required for the production of surgical anæsthesia are about double those of thiopentone required in similar circumstances.

METHODS USED

We have used kemithal in four ways: for induction before cyclopropane anæsthesia; as the primary anæsthetic in combination with nitrous oxide and oxygen; as the sole anæsthetic, with or without oxygen; and to produce hypnosis in association with regional anæsthesia.

Two methods have been used for administration. For induction before cyclopropane anæsthesia the drug was injected with a syringe in 5% or 10% solution. Intermittent injection in the same concentrations was used for a few short minor procedures. In most cases where it was used as the primary anæsthetic it was administered by a continuous intravenous drip technique in 1% solution in normal saline. In all cases patients received 'Omnopon' gr. 1/3 and scopolamine gr. 1/150 an hour and a half before operation.

RESULTS

Induction with the 5% or 10% solution was smooth in practically all and rapid in most cases. When the 1% solution was used induction was smooth, but, as was to be expected, not so rapid. As with other barbiturates, the rapidity of induction varies with each patient, depending on physical state, sedation, individual tolerance to barbiturates, and rate of injection. The average time required for induction with the 5% or 10% solution was 20–30 sec., and with the 1% solution up to 60 sec.

The amount of kemithal required for induction was a little more than twice that of thiopentone. The injection of 0·3–0·4 g. of kemithal made most patients drowsy, with slow thick speech; 0·4–0·6 g. put them to sleep from which they were easily roused. A total of 0·5–0·7 g. induced them to a level of anæsthesia which would be sufficient for switching to inhalation anæsthesia, but recovery from this dose was often so rapid that after two or three inspirations the patient would be light enough to object to the presence of a mask on the face. A further injection of 0·1–0·2 c.cm. of the 5% solution was sufficient to get by this point and allowed time for establishment of cyclopropane anæsthesia. The average amount of the drug required for induction was 0·75 g., the maximum 1·0 g., and the minimum 0·3 g.

Complications, such as sneezing, coughing, laryngospasm, excitement, and tremors during induction, were rare. In this series of 372 patients only 4 sneezed or coughed, 5 exhibited some excitement, 1 developed laryngospasm after a period of coughing, and 4 had slight muscle tremors; 2 felt nauseated. No patient complained of tasting the drug. Respiration was depressed in 1 case where 1 g. of kemithal was injected fairly rapidly.

The course of cyclopropane anæsthesia after induction with kemithal was uneventful, and no abnormalities developed which could be attributed to the drug. Of this series 208 patients received kemithal as a principal anæsthetic, 66 of these without adjuvant anæsthetic, and 142 with the addition of N_2O-oxygen 50/50 as a secondary agent. The usual method of administration was 1% solution by continuous intravenous drip throughout. A few cases were induced with a 5% solution and maintained with a drip of 1% solution; 8 patients requiring short minor operations were anæsthetised by the intermittent injection of a 5% or 10% solution. Of the 208 patients, 160 required endotracheal intubation (orotracheal 103, nasotracheal 57). Partial topical anæsthesia was obtained with a cocaine spray before intubation. N_2O-oxygen was administered in 132 cases from a Heidbrink anæsthetic gas machine with closed circle absorption of carbon dioxide, and in the other 10 from a Boyle's machine by the continuous flow technique with partial rebreathing. In all cases where kemithal was used alone or in combination maintenance at a good level of anæsthesia was easy, and there were few complications either during or after operation.

CARDIOVASCULAR EFFECTS

In all cases there was a slight initial fall in both systolic and diastolic blood-pressure, with a small decrease in pulse pressure. This fall in blood-pressure was usually 10–15 mm. Hg. Recovery to normal was complete in 10–15 min. Five cases showed a further fall in blood-pressure after this initial decrease. Systolic pressures below 100 mm. Hg were recorded in these five cases, the lowest being 60 mm. Hg. No further injection of kemithal was made in these cases for some time, and the blood-pressure gradually recovered its normal level as depth of anæsthesia decreased. The patient whose systolic blood-pressure fell to 60 mm. Hg had had an adrenaline pack (1/50,000 solution) placed on a large raw area of his face to stop capillary oozing.

In 3 cases there was an elevation of blood-pressure above the pre-induction level after the initial drop.

In the first of these cases the preoperative systolic pressure was 120 mm. Hg and on induction it fell to 110. Anæsthesia was light when surgical manipulation was begun, and the patient moved. The blood-pressure rose at this point to 160/108; and, although a satisfactory level of anæsthesia was quickly established, and the airway through the endotracheal tube was patent and adequate, throughout operation

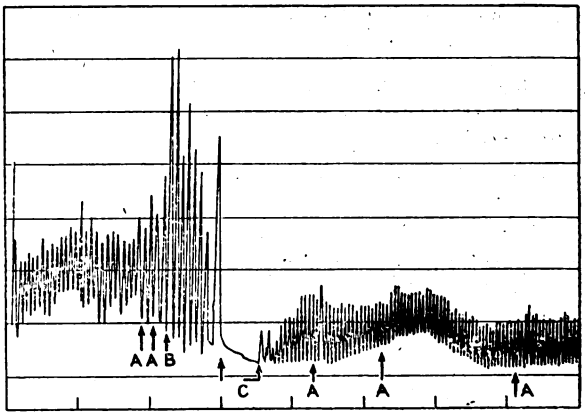

Fig. I—Anæsthesia without operation. Intermittent injection technique. Hyperventilation during induction, followed by period of apnœa. Note increase in depth of respiration after each injection of kemithal. A, injection of 10% solution of kemithal (1st injection 2 c.cm., each later injection 3 c.cm.); B, loss of consciousness; C, period of apnœa.

1. Carrington, H. C., Raventos, J. (1946) in the press.

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the blood-pressure did not return to the normal level. In the second case the blood-pressure rose to 160/120, owing to constriction of the nasal endotracheal tube. In the third case the blood-pressure rose from 110/70 to 140/100, without any obvious explanation.

All cases demonstrated some increase in pulse-rate on induction, coincident with the decrease in blood-pressure and returning towards normal pre-induction rates as the blood-pressure returned towards normal. Occasionally the pulse remained slightly fast during the course of anæsthesia but not remarkably so. There was no case of cardiac irregularity in this series. One case of bradycardia was recorded, the pulse-rate in this instance decreasing from a normal of 68 to 48 per min.; pulse volume and cardiac rhythm remained good, and blood-pressure and respirations were normal.

Tachycardia developed in 3 cases. Increased intracranial pressure, a poor airway with laboured breathing due to compression of the endotracheal tube in the nose, and surgical hæmorrhage appear to be the causal factors in these 3 cases rather than any specific effect of the kemithal.

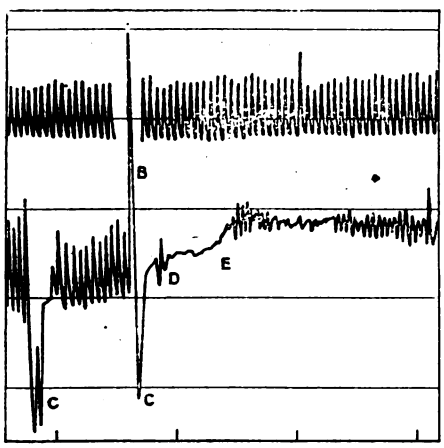

Fig. 2—Respiratory depression following too rapid infusion of kemithal solution (1%) to control cough (C). Respiratory depression transient. Upper tracing 5 min. later. B, loss of consciousness; D, drum stopped for 5 min.; E, first response to skin stimulation.

The incidence of venous thrombosis was not investigated in this series. There has been no complaint from any patient of pain at the site of injection of the kemithal solution or in the vein into which it was injected. No embolism developed.

Accidental injection of kemithal in 10% solution into a superficial ulnar artery produced pain and vasospastic phenomena in the hand and arm, relieved immediately by brachial-plexus block. The vasospasm recurred three hours after induction of the brachial-plexus block and was again relieved by procaine block of the stellate ganglion of the same side. There was no recurrence, and the patient recovered without further incident.

RESPIRATORY EFFECTS

Respiratory depression developed in 5 patients.

In one of these cases the depression was associated with a considerable fall in blood-pressure and appears to have been due to an overdose of kemithal. This patient received 2·6 g. of kemithal in 75 min., which is not an unusual dosage for this period of time. The second patient in this group had respiratory depression after a period of laryngospasm brought on by an attempt at intubation at too light a plane of anæsthesia. In the third case respirations decreased in rate and depth after an uneventful intubation and remained depressed for an hour. Unfortunately no record was kept of the amount of kemithal administered to this patient, but we feel that the respiratory depression was due to overdosage. In the fourth case respirations were 8 per min. at the end of operation, kemithal 3·25 g. having been given in 2½ hours. In the fifth case respirations were 4 per min. on return to ward, after kemithal 7 g. had been given in 1¾ hours. The last two patients were given nikethamide with satisfactory results.

Respiratory records were obtained from 24 patients during anæsthesia with kemithal without adjuvant

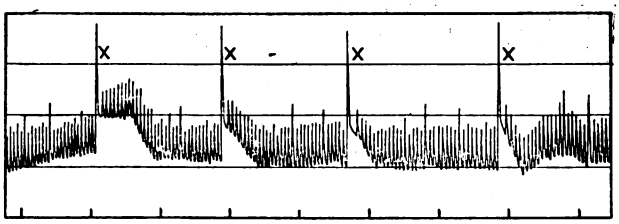

Fig. 3—Sighing respiration during surgical anæsthesia with kemithal.

anæsthesia. The spirometer was placed in the anæsthetic circuit in place of the rebreathing bag. Tracings were obtained throughout induction and operation. Pre-induction tracings were made. In 1 case the drug was injected intermittently in 10% solution. No operation was performed in this instance, but anæsthesia was tested by stimulation of the palm of the hand with a needle. In the other 23 cases the drug was injected by continuous intravenous drip in 1% solution. The operations undertaken on the 23 operated cases were all plastic surgery and varied from bone grafts to the mandible to simple secondary closure of wounds. Many of these involved the cutting of split skin grafts, which is a most stimulating operation and requires profound anæsthesia. Comparison of pre-induction respiratory rate and volume with that recorded during surgical anæsthesia with kemithal is shown in the table. Patients breathed 100% oxygen from the spirometer.

It proved difficult in some patients to obtain a satisfactory pre-induction record of respirations owing to apprehension or overconscientious attempts to coöperate. The pre-induction records of cases 2, 7, 10, 20, 22, and 23 were unsatisfactory for this reason. Patients 6, 11, and 14 had facial injuries which precluded the possibility of placing a mask on the face, and in these it was not possible to take a pre-induction record, the first record being obtained after endotracheal intubation.

Respiratory rates and tidal volumes during surgical anæsthesia as recorded in the table are not necessarily the minimal or maximal values but have been calculated from portions of the record which represented an average depth of anæsthesia during the operation. Minute ventilation was low during anæsthesia in 4 patients (cases 6, 18, 20, and 24). We feel, however, that this degree of ventilation was adequate for the conditions under which the records were made. These patients had

COMPARISON OF RESPIRATORY RATES AND VOLUMES

Case no.	Pre-induction			During surgical anæsthesia		
	Respirations per min.	Tidal volume (c.cm.)	Minute ventilation (c.cm.)	Respirations per min.	Tidal volume (c.cm.)	Minute ventilation (c.cm.)
1	15	560	8400	20	400	8000
2	..	..	..	14	500	7000
3	16	600	9600	25	300	7500
4	15	625	9375	18	500	9000
5	14	600	8400	16	500	8000
6	..	..	..	13	350 (irregular)	4450
7	18	..	..	17	400	6800
8	13	550	7150	15	500	7500
9	16	..	..	18	300	6400
10	10	800*	8000*	16	400	6400
11	..	..	..	17	400	6800
12	16	500	8000	18	400	7200
13	19	400	7600	24	325	7800
14	..	..	..	20	350	7000
15	14	350	4900	12	500	6000
16	15	300	4500	15	450	6750
17	15	450	6750	21	450	9450
18	16	450	7200	7	800	5600
19	18	400	7200	15	400	6000
20	18	..	..	22	250	5500
21	22	300	6600	19	300	5700
22	20	..	..	21	350	7350
23	19	..	..	18	450	8100
24	17	350	5950	18	300	5400

Patients breathing 100% oxygen in closed system with CO_2 absorption. * Hyperventilating.

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endotracheal tubes in place and were breathing pure oxygen in a closed circuit with efficient absorption of carbon dioxide.

Respiratory rate was significantly depressed in one patient only, but in this case the tidal volume was so increased that adequate ventilation was maintained. Respiratory rate was increased in 13 of the 21 cases in which a pre-induction record of rate is available,

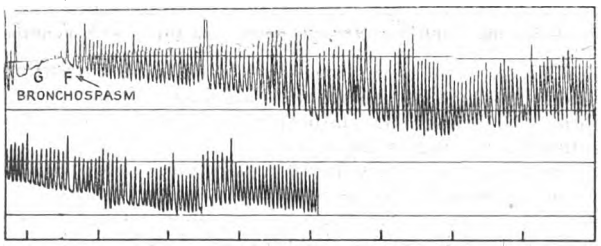

Fig. 4—Irregular respiration following a period of bronchospasm (G to F) resulting from movement of the endotracheal tube during light anæsthesia.

although in 6 of these the increase was so small as to lack significance. In 6 cases the rate was decreased, and in 1 there was no change.

Fig. 1 shows the first portion of the respiratory record of an unpremedicated patient to whom kemithal was administered by the intermittent injection technique. Anæsthesia was tested by stimulation with a needle. There was a well-marked stimulation of respiration during induction, leading to a period of apnœa which persisted for 30 sec. During the subsequent course of anæsthesia there was a noticeable stimulation of respiration following the injection of each dose of kemithal. This feature is not seen when the continuous drip technique of administration is used.

Fig. 2 shows the typical depression of respiration following the too rapid infusion of kemithal and the usual transient nature of this depression (continuous drip technique). In this case the rate of infusion was increased to a steady flow to deepen anæsthesia to bring the cough-reflex under control.

Fig. 3 shows periodic sighing respiration. Occasional sighing respiration (x) is seen in patients during most types of anæsthesia and has not been a conspicuous feature of anæsthesia with kemithal. Its regularity in this patient is most unusual, and it persisted in spite of adequate respiratory exchange, fresh soda-lime, and 100% oxygen.

Fig. 4 shows irregular respiration following a period of bronchospasm induced by movement of the endotracheal tube during light anæsthesia. This is a usual reaction following such episodes and in this patient persisted for 16 min.

Fig. 5 shows two tracings of the usual type of respiration during surgical anæsthesia with kemithal.

OPERATIONS PERFORMED UNDER KEMITHAL ANÆSTHESIA

The regions involved in operations performed on the patients anæsthetised with kemithal alone or with kemithal with N_2O-oxygen were as follows:

Site(s) of operation	*No. of cases*
No operation	2
Extremities	133
Body wall	58
Mouth, nose, and throat	77
Brain and spinal cord	21
Other head and neck operations	177
Bronchoscopy	2
Genito-urinary	2

(More than one site was involved in most patients.)

There are no cases of laparotomy in this series. For operations in the regions indicated above we have found kemithal to be a most satisfactory anæsthetic agent when given by the techniques we have used.

PREOPERATIVE COMPLICATIONS

In the 208 cases in which kemithal was used as the principal anæsthetic agent preoperative complications were present in 37. There were 5 patients with preoperative major respiratory complications. In 2 of these there was a through-and-through gunshot wound of the chest, and in a third a retained metallic foreign body in the right lung.

The first of these patients had an area of atelectasis and consolidation (probably hæmorrhage) in the base of the upper lobe of the right lung. The second had atelectasis of the lower lobe of the left lung, which had been allowed to persist for some days and did not respond to treatment by bronchoscopic aspiration. Both patients recovered their reflexes in the operating-theatre, and developed no postoperative complications. The third patient had burns, with sloughing of tongue and posterior pharynx. The fourth patient had post-operative atelectasis three weeks previously. The fifth patient's respiratory passages were obstructed with blood and mucus, and the patient was cyanosed.

In 14 patients there were minor respiratory complications, such as recent sore throat, blood in the airway, recent respiratory infection, or mild upper respiratory infection at the time of operation. No postoperative complications developed in any of these patients.

In 4 patients there were hæmoglobin values between 54% and 71% before anæsthesia. All received blood-transfusions during operation, and no complications developed either during or after anæsthesia.

In 19 patients there were complications related to the central nervous system before operation: 13 penetrating wounds of the head; 3 closed cerebral injuries due to gunshot wounds of the scalp; 2 brain abscesses following a gunshot wound of the head; and 1 craniotomy for removal of a frontal-lobe tumour 48 hours before the anæsthesia with kemithal.

Postoperatively the last patient had complications of increased intracranial pressure and vomiting, which were probably related to his original disease rather than to the kemithal. A second case with a penetrating gunshot wound of frontal sinus and brain, plus a major respiratory pre-operative complication (passages obstructed with blood and mucus), never recovered consciousness and died ten days after operation.

POSTOPERATIVE COMPLICATIONS

Postoperative complications developed in 34 patients of those who received kemithal as the principal anæsthetic agent. Of these 15 vomited during the twelve-hour period immediately following operation: in 11 of these there appeared to be a relation to therapy with sulphonamide drugs; the remainder vomited from one to three times during the recovery period only.

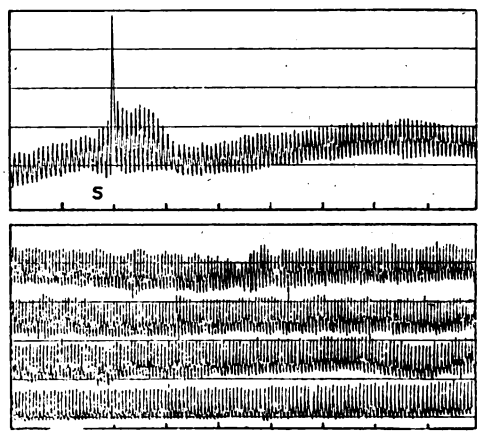

Fig. 5—Two examples of the usual type of respiration during surgical anæsthesia with kemithal. S, surgical stimulus.

Lobular or lobar pulmonary atelectasis developed in 5 patients. With one exception these were patients who had been subjected to operation for bone grafting of the mandible, the graft being taken in each instance from the iliac crest. The other patient had a burnt hand embedded in the abdominal wall and confessed to a voluntary restraint of coughing and movement. These cases of atelectasis therefore appear to be related more to the site of operation than to anæsthesia, since they did not develop in other patients anæsthetised with

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kemithal by the same technique, although some of these other patients had some bleeding into the airway at the conclusion of operation.

One patient had urinary retention for twenty-four hours after an iliac bone graft to the mandible. He was not catheterised and was able to micturate on standing.

Complications of the central nervous system were remarkably few. Two patients had postoperative headache; these were probably related to the site of operation, a mastoidectomy, and to sulphonamide therapy. Only one patient had postoperative excitement. There were 2 cases of postanæsthetic depression of respiration, described under respiratory effects. This has been the most striking feature in comparing this drug with our experience with pentothal.

DOSAGE

The average amount of kemithal required for induction of surgical anæsthesia was 0·75 g., the maximum 1·0 g., and the minimum 0·3 g. After induction the average maintenance dose, with the continuous drip technique, was 1 g. per hour of anæsthesia. Some patients, after a fairly rapid injection of 1·75–2·0 g. for induction and intubation, required very little additional kemithal for maintenance—e.g., 0·4 g. per hour—whereas others in the same circumstances required 2 g. per hour. The maximal total dose used was 7 g., administered during two hours.

RECOVERY

Recovery in this series was fairly rapid, even when anæsthesia had been maintained for several hours and when large doses had been administered. Protective reflexes were present in the operating-theatre in 119 of the 208 cases anæsthetised with kemithal alone. The remainder recovered reflexes in the wards and responded to stimulation or orders usually within 30–45 min. In a few cases, in which the operation had been very prolonged, a longer period of recovery was noted. The maximum was 3¼ hours.

BLOOD-CLOTTING

Clotting-time was investigated in 10 patients anæsthetised with kemithal alone. Determinations were done preoperatively at periods of 15, 30, and 60 min. after induction of anæsthesia, and an hour after the cessation of anæsthesia. Of the 10 patients, 7 showed a progressive increase in clotting-time of 1¾–2 min. up to an hour postoperatively. The remaining 3 patients showed no consistent or significant change. These slight increases in clotting-time did not appear to affect bleeding either during or after operation.

CONCLUSIONS

Kemithal is an effective anæsthetic agent when given in adequate dosage by the techniques described. Although the dosage required is about twice that of thiopentone required when used in a similar fashion, the respiratory function appears to be less depressed in the planes of anæsthesia required for surgical procedures with kemithal than with thiopentone. The absence of protracted postoperative depression and excitement during recovery is an outstanding feature of our experience with this series of 208 cases. These advantages appear most distinctly in anæsthesia of long duration.

SUMMARY

Kemithal (5-cyclohexanyl-5-allyl-2-thiobarbituric acid) has been used as an anæsthetic agent in 372 cases in a year. The drug has been used for induction before cyclopropane anæsthesia, as the principal anæsthetic agent in combination with nitrous oxide and oxygen, as the sole anæsthetic agent, and to produce hypnosis in association with regional anæsthesia.

Kemithal has been injected intermittently in 5% and 10% solution and continuously by an intravenous drip in 1% solution. The majority of patients have had endotracheal tubes inserted during anæsthesia by all techniques, except in association with regional anæsthesia.

Cardiovascular and respiratory effects of the drug are described, with spirometer records of respiration during anæsthesia.

Postoperative recovery has been rapid and devoid of complications. Postanæsthetic depression and excitement have each been encountered in one case in this series.

Major postoperative complications appear to have been related to the site of operation or to the original disease rather than to the use of kemithal.

Kemithal is a satisfactory anæsthetic agent, which has particular advantages when anæsthesia must be maintained for a long time.

We wish to thank Imperial Chemical (Pharmaceuticals) Ltd. and Dr. R. P. Liston, of that company, for the opportunity to investigate the clinical value of this drug, and Captain S. A. Fleming and Captain P. Perchison, R.C.A.M.C., who anæsthetised patients included in this series.

KEMITHAL ANÆSTHESIA IN THORACIC OPERATIONS

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IN patients requiring thoracic surgery there is usually a diminished vital capacity which is nearly always further reduced when they are placed in position for operation with the sound lung lowermost. Any anæsthetic or technique which tends to cause further embarrassment is therefore debarred; hyperoxygenation must be ensured throughout the operation. Most of these patients have an extremely sensitive cough-reflex, with an increased irritability of the innervation of the bronchial tree. Every effort must be made, especially during induction, to see that no excessive stimulation occurs, since a bout of coughing may rupture an abscess, cause a hæmorrhage, or lead to the uncontrolled emptying of a bronchiectatic lobe into vital air-passages. Tuberculous patients are extremely liable to gastric disturbances after even the most minor of surgical procedures; it is therefore essential to avoid any drug or method which might increase this idiosyncrasy. Excessive postoperative vomiting will not only cause distress and delay convalescence but also may, by excessive straining, do irreparable harm at the site of the operation. A rapid induction to a plane of anæsthesia commensurate with the easy passage of an endotracheal tube must be readily and unfailingly possible, yet the method or drug used must not produce shock. During the operation the respiratory exchange must be efficiently maintained, and anoxia must never be allowed to develop. The diaphragm must be stationary or barely moving, and the lung should not obtrude into the operative field. The return of the cough-reflex should coincide with the end of the operation, and the patient should be able to coöperate with the nursing staff within an hour.

No real advance towards the solution of these problems, or approach to these ideals, had been made in this country until Nosworthy described controlled respiration with cyclopropane and oxygen. This technique was a big step forward, but later experience revealed disadvantages. During long operations the method tends to keep the blood-pressure at an apparently favourable level, yet half an hour after the patient has been returned to bed a considerable degree of secondary shock has often become manifest. The long-continued exhibition of cyclopropane produces postoperative vomiting in some cases, and there is clinical evidence to show that it gives rise to a toxic action in the body which places the patient below par for the subsequent forty-

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eight hours, a state comparable to recovery from chloroform.

BARBITURATE ANÆSTHESIA

A trial with soluble thiopentone as the sole anæsthetic was started two years ago. The first 30 cases showed that, although the method presented difficulties; the postoperative condition of the patients was consistently favourable compared with other anæsthetics and techniques. Laryngeal spasm was a recurring complication, but this could be reasonably controlled by producing an efficient local anæsthesia of the pyriform fossæ and the larynx. The main anxiety arose from the fact that the dose of thiopentone required to produce a successful anæsthesia lay very near the toxic level. Too often a delayed recovery offset the obvious advantages of the technique.

Then an opportunity was offered by Imperial Chemical (Pharmaceuticals) Ltd. for the clinical trial of 'Kemithal,' which soon proved to have many advantages over the other barbiturates. Laryngeal spasm was notably absent, jaw relaxation was extremely good, and respiration was not so depressed, yet controlled respiration with oxygen alone in a closed circuit was easily possible in most cases. For these reasons it was obvious that the anæsthetic dose was well below the toxic dose. More than 300 major thoracic cases have been anæsthetised, up to date, with kemithal, and a routine technique for its administration has been worked out.

TECHNIQUE

The patient is premedicated with morphine gr. 1/6 and atropine gr. 1/150 an hour before operation. Ten minutes before the patient leaves the ward a tablet of 'Nupercaine' is given and allowed to dissolve slowly in the mouth. On the patient's arrival in the anæsthetic room the throat is sprayed three times, at intervals of two minutes, with a 2% solution of amethocaine hydrochloride ('Anethaine'), and the pyriform fossæ are swabbed by means of a special applicator with the same solution. Next the arm selected for venepuncture is splinted, and a three-way tap having one vertical and two horizontal limbs is strapped round the arm and the splint between the elbow and the wrist. Kemithal is administered by the intermittent method; to ensure that there shall be no clotting in the needle during operation, a standard drip apparatus is fixed to the vertical limb of the tap, and saline, plasma, or blood is kept running throughout the operation. A short length of transparent 'Latex' tubing carrying the intravenous needle is affixed to that limb of the tap which lies towards the antecubital fossa; the third limb has a socket which fits the nozzle of a standard 'Record' syringe.

Induction is carried out by the injection of a 10% solution of kemithal, preferably from an all-glass syringe, which is fitted to the socket on the third limb of the tap; the amount varies between 0·75 and 1·5 g., according to the requirements of the patient. If more than 2 g. is required the patient probably has a natural resistance to the drug, and experience shows that it is better to continue the anæsthesia by some other method. It appears that patients who require more than the average dose of any of the barbiturates metabolise and eliminate the drug so extremely badly that recovery is always tardy.

Anæsthesia is maintained by the intermittent injection of 0·1 g., as the reaction of the patient to surgical stimuli demands. A lightening of the anæsthesia is heralded by an increase in pulse-rate, deepening and increase in respiratory rhythm, and a return of the cough-reflex; this if allowed will pass on to swallowing, incoördinated movements, and actual phonation.

Bronchoscopy in a healthy man is easily possible under a single dose of 1·5 g. of kemithal and a very moderate degree of local anæsthesia—spraying the throat twice with 1% anethaine is usually sufficient—but an added advantage is gained if the carina is sprayed by direct vision after the bronchoscope is in place and before manipulation begins. Women usually require 1 g., and children something between 0·5 and 1 g.

Thoracoplasty may or may not demand an anæsthetic technique by which respiration can be controlled. This is most often needed in the first stage, where an apicolysis is performed on a patient with a soft lesion and a mobile mediastinum. In anticipation of this need it has been the custom to insert an airway and fix a well-fitting mask in all first-stage thoracoplasties. Oxygen at the rate of 2½ litres per min. is then given into the mask; and, if during the course of the operation the control of respiration is considered to be desirable, experience with kemithal has shown that this is easily possible with oxygen alone in a closed circuit owing to the absence of laryngeal spasm. For the second and third stages, oxygen at 2½ litres per min. into a Clausen's airway has been the routine method of administration. If during the first stage there is any persistence of the cough-reflex, it is better to introduce a minimum of cyclopropane into the circuit rather than attempt to control it by increasing the concentration of the circulating kemithal. As there is no laryngeal spasm, a perfect airway is easily maintained, and no intrabronchial intubation is necessary. This is a decided advantage during convalescence, since intubation, by damaging the ciliated epithelium of the upper respiratory tract, may be one of the main causes of postoperative atelectasis.

Thoracotomy for lung abscess, lobectomy, or pneumonectomy is conducted along the same lines; although, where a "wet" case is encountered, bronchial occlusion or intrabronchial drainage may necessitate the passage of an intratracheal tube. Here again the absence of laryngeal spasm renders this a comparatively simple proceeding, whether it is performed by direct vision or by Magill's blind technique. If the latter technique is decided on, the inhalation of carbon dioxide before the passage of the tube greatly facilitates this operation.

In a long operation, when the dose of kemithal has reached 4·5 g., it is preferable to maintain anæsthesia with minimal cyclopropane rather than continue with the intravenous barbiturate. The successive doses of kemithal, as with other barbiturates, can be progressively reduced as the operation proceeds, and they are required at longer intervals. The larger the dose of barbiturate, the greater the risk of delay in recovery. The blood-pressure is consistently well maintained during operation, and postoperatively, unless the time factor has been unduly lengthened, no alarming falls have been encountered.

Recovery after the correct dose of kemithal is rapid, and the essential reflexes are nearly always present before the patient leaves the table. Fifty-five minutes has been the average time in this series of major thoracic cases for the patient to become coöperative, to be sat up in bed, and to be able to cough. In 4% of the cases recovery has been delayed for an hour and a half; this has always been due to overdosage. Restlessness is rare; a small degree in the first half-hour has been manifest in 5% of the cases. It is readily controlled with 'Dilaudid' gr. 1/32 or 'Omnopon' gr. 1/3 given hypodermically. Vomiting has occurred in the first twelve hours in 7 cases, 4 of which were children under fourteen years. It was not severe and was probably due in every case to an idiosyncrasy to morphine. 'Collosol' kaolin by mouth has controlled this condition. No deaths directly attributable to the anæsthetic have taken place in this series. Besides the 300 thoracic cases reported here, kemithal has been used either alone or in combination with other anæsthetics in some 700 varied surgical operations with complete satisfaction.

Experimental work with *d*-tubocurarine chloride given intravenously in conjunction with kemithal in 40 cases has produced some interesting results. The dosage of the thiobarbiturate can be at least halved, and cough and spasm are completely obliterated. Respiratory control is much more readily obtained, and the risk of overdosage, measured by delay in recovery, is considerably lessened. Investigation along these lines is being

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pursued, and it is believed that this technique represents a further advance in the conduct of anæsthesia in thoracic operations.

SUMMARY

Kemithal has been used as the main anæsthetic in over 300 major thoracic operations.

Respiration is not unduly depressed, relaxation of the jaw is good, and the consistent absence of laryngeal and bronchial spasm enables respiration to be controlled with oxygen alone in a closed circuit without intubation.

Where the condition of the patient demands bronchial occlusion or intrabronchial drainage, the absence of spasm and the jaw relaxation render intubation a simple matter at a light plane of anæsthesia.

Recovery is rapid, the postoperative condition of cases is consistently good, and vomiting and restlessness are rare.

The use of *d*-tubocurarine chloride in conjunction with kemithal in 40 cases has produced promising results.

LIPODYSTROPHY AND HEPATOMEGALY WITH DIABETES, LIPÆMIA, AND OTHER METABOLIC DISTURBANCES

A CASE THROWING NEW LIGHT ON THE ACTION OF INSULIN

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(*Concluded from p.* 731)

I SHALL now try to present a unifying explanation of this confusing pattern of abnormalities. This involves more than a little speculation.

I regard the lipo-atrophy as the corner-stone in the explanation. No fat could be stored in the usual depots, and so it circulated in excess and produced lipæmia. The lipæmia depended directly on the level of the blood-sugar and disappeared repeatedly when the hyperglycæmia was controlled by enormous doses of insulin. The fat came from excess sugar and not from dietary fat, and insulin prevented lipæmia only when it controlled hyperglycæmia. The high blood-sugar level and the disturbance of carbohydrate metabolism differed from ordinary diabetes in the extreme resistance to the action of insulin, in the absence of ketosis, and in the histological normality of the pancreas, unusual after seven years. I think it unlikely that there was anything wrong with the islet apparatus or endogenous insulin production, and in my view the hyperglycæmia was due to an inability to change blood-sugar into stored fat.

This is the explanation I offer of the insulin resistance, and it suggests an important end-action of insulin which has hardly been suspected—namely, to change an excess of blood-sugar into stored fat. If the fat cannot be stored, insulin is relatively ineffective, and the sugar as well as fat-metabolites circulate in excess, as in this case.

INSULIN AND THE FORMATION OF FAT FROM CARBOHYDRATE

When the animal organism reached the stage of a specialised alimentary system, it evolved not only digestive enzymes but also other humoral hormones or enzymes, such as insulin and amylase, to partition and regulate the fate of absorbed food. The great survival value in a precarious world of an internal food store is obvious—a food store to be filled in times of plenty and drawn on in starvation. Carbohydrate and protein provide a relatively very small store, and fat is the only depot fuel stored in large amounts. This fat is laid down not only from dietary fat but also from excess carbohydrate, which is probably the major source of depot fat in man since he has cultivated and eaten cereals and sugar. It is clearly accepted that insulin plays an all-important part in the storage of ingested carbohydrate as glycogen in the liver and muscles. That insulin may be equally necessary for the change of carbohydrate into depot fat is neither recognised nor clearly known but is strongly supported by recent experimental work.

There has long been a mystery about the fate of ingested sugar in normal animals either with or without extra insulin, for neither increased oxidation nor glycogen deposition could explain it all. Working on this problem in rats Mackay and Drury (1941) have shown that the major part of the carbohydrate intake is stored as fat, not glycogen. Stetten and Boxer (1944a) studied the rate of turnover of glycogen in the liver and carcass of normal rats by means of deuterium and found that "only 3% of the dietary glucose was handled by way of glycogen, and that at least 10 times as much was used to synthesise fatty acids as was used to synthesise glycogen." And later (1944b), working with rats made diabetic with alloxan, the same workers found "that the utilisation of glucose for fatty acid synthesis fell to about 5% of the figure of the normal rat. This marked impairment of fatty acid formation from carbohydrate precursors results in the loss of depot fat, and a large part of the urinary glucose must be ascribed to the non-utilisation of sugar in the synthesis of fatty acids."

All this suggests that a large proportion of ingested sugar goes straight into fat depot, and that insulin is necessary for this; but it gives no inkling of the mechanism. A mechanism, however, is suggested by the work of Wertheimer and his associates, first in Germany and now in Palestine, on glycogen in fatty tissues. Their publications, apparently little known, have established the presence in fat of glycogen chemically indistinguishable from glycogen elsewhere; and their latest paper (Tuerkischer and Wertheimer 1942) has a close bearing on the formation of depot fat from carbohydrate. In rats starved long enough to lose weight they have demonstrated that the recommencement of carbohydrate food, and of carbohydrate food only, produces for 1–3 days an increase up to 2% in the glycogen in the general subcutaneous fat and up to 7% in the more glycogen-rich interscapular fat. This glycogen increase disappears in the next two days even on the same diet, and at the same time the fat-content of the tissues increases.

Their work has clearly demonstrated a glycogen stage in fatty tissues during the formation of depot fat from carbohydrate. Whether insulin is required for this and whether this is the stage of its action has not been proved, but it seems likely from what we know of the glycogenic function of insulin in liver and muscle. At any rate all these experiments suggest that one important action of insulin is concerned with the conversion of excess carbohydrate into fat and its storage. Quantitatively indeed the end-action of insulin is more lipogenic than glycogenic. In the rare absence of a fat depot this full end-action of insulin obviously cannot take place, and this would explain the hyperglycæmia and lipæmia of my strange case and the diabetes recorded in two other cases of complete lipo-atrophy.

HORMONAL INFLUENCES IN FAT METABOLISM

All the above gets us no further in the explanation of the lipodystrophy which I have postulated as my patient's primary defect. All I can say is that her depot tissues did not fix fat; and, to press the explanation further, I should have to postulate that there is a fat-fixing factor or hormone which she lacked. Teleological arguments for the necessity for a lipopexic hormone ($\pi \eta \xi$ is = fixing) could be produced, but no experimental or other substantial evidence. If such a factor there be, it can hardly ever be defective, since lipo-atrophy is so rare.

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There is, on the other hand, definite evidence of the existence of endocrine factors with an opposite catabolic effect on stored fat. A pituitary ketogenic hormone was first demonstrated by Burn and Ling (1928), and we shall see that there is probably another factor of wider action in stimulating a general fat-catabolism ¶ than mere ketosis, which is, after all, only one specific path in the total processes of fat-combustion. Young's (1941) diabetogenic pituitary extract is also ketogenic in dogs, but this effect has not been clearly separated from its diabetic action. The mode of action of his extract in initiating the diabetic process is not clearly known, unfortunately for human ætiology, although some workers say that its primary action is to diminish the peripheral use of sugar.

But Young's (1945) most recent synthesis of his years of experimental work demonstrates an extraordinary unexpected metabolic condition which suggests, to me at least, that it produces diabetes primarily by increasing fat-catabolism. In the early stages of this diabetes, during which there is an actual increase in insulin secretion, the dogs show a surprising gain in weight in spite of being on a fixed diet and developing a heavy glycosuria. Young has proved that this rise in weight is due to two simultaneous processes: (1) large retention of nitrogen, and (2) the almost exclusive catabolism of fat to meet calorie requirements. There is certainly no lack of insulin to explain the initial hyperglycæmia, but the increased fat-catabolism would account for it by preventing the change of excess sugar produced from food into stored fat, which is its usual fate in the presence of insulin. This sugar must circulate in excess, and so the hyperglycæmic process is started, at first with a stimulation of increased insulin but ultimately with a complete atrophy of the islets and a resultant severe and permanent diabetes requiring insulin in moderate doses for survival. If more pituitary extract is now injected, the dog becomes quite as insulin-resistant as the present case, because, I suggest, circulating sugar again cannot be stored as fat.

OBESITY AND DIABETES

Although loss of weight is constantly present in severe diabetes, obesity is a very common feature in early diabetic states and after insulin treatment. I have discussed this problem (Lawrence 1941) and suggested that obesity developed in all hyperglycæmic states in which there was no gross insulin defect, a fact which I still think true. But at that time I looked on a slight unexplained defect in insulin production as the primary cause of the hyperglycæmia which resulted in obesity. This I now doubt and I would draw attention to another point of view, suggested by consideration of the increasingly common mild obese diabetes seen mostly in middle age and especially in females, the *diabète gras* which the French contrasted so strongly last century with *diabète maigre*.

The striking characteristic of this condition is that, even when glycosuria is heavy, ketosis is completely absent, although on extreme low-carbohydrate diets or during infections some ketonuria may appear. Treatment with low-carbohydrate and low-calorie diets rapidly clears the glycosuria; and, if persistence with such diets approximately restores the patient's juvenile figure by the loss of 20–60 lb., the diabetes seems to disappear, a normal diet can be tolerated for a time, and even the glucose-tolerance test may become normal. But inevitably, if laxity in diet again causes a substantial increase in weight, the "diabetes" returns, although it may remain for years in a mild form without ketosis or the necessity for insulin. Indeed I consider the use of insulin with high or even moderately high carbohydrate bad treatment in these cases, since it prevents the loss of weight I consider the fundamental treatment. The dangers they face are vascular and ocular complications, not coma. This type of diabetes is relatively insulin-insensitive, but the presence of an anti-insulin substance in the blood, which de Wesselow and Griffiths (1936) claimed to have demonstrated, has been disproved by subsequent workers, most recently and thoroughly by Gray and Oakley (1946). The difficulty of their overfilled fat stores to accept circulating sugar is a better explanation of their insulin-resistance.

The development and vagaries of this type of diabetes seem to be linked directly with the overfilling and emptying of fat stores; and the above facts lead me to suggest, though I cannot prove it, that the hyperglycæmic state does not arise from a primary insulin failure but from such an overfilling of the fat depots that they can no longer accept and absorb an excess of sugar from food.

It is perhaps over bold to suggest that the initial obesity, often hereditary, is an endocrine disturbance due to an excess of lipopexic hormone or a diminution of lipocatabolic hormone, and that we should turn to the pituitary for such hypothetical substances. But it is tempting to inculpate this gland in view of the work of Burn and Young and because there are so many experimental states and clinical syndromes in which obesity develops in recognised pituitary disturbances. The resemblance, too, between the obesity and diabetes of Cushing's pituitary syndrome and the cases I have just described is particularly striking.

All this is highly speculative, but so was Schafer's naming of insulin several years before it was discovered, and perhaps an occasional imaginative suggestion is permissible and useful in the inexact science of medicine as well as in the arts. The problem of endogenous obesity is almost untouched, and it also remains a complete mystery why one individual or race is fat and another thin without any obvious difference in what they eat. In the study of these problems it may be fruitful to bear in mind not only the effect of diet and the carbohydrate fat mechanism of insulin but also the possibility of a hormonal control of local fat depots such as I have suggested.

THE HIGH METABOLIC RATE

I can offer no explanation for the astonishing B.M.R. in my patient. On a-priori grounds it might appear that the excess of circulating sugar and fat which could not be stored had to be burnt and so raised the metabolic rate. But at periods when these excesses were controlled by vast doses of insulin no clear diminution was observed in a few odd determinations. It was never possible to make a long series of daily estimations.

PATHOLOGICAL CHANGES

The pathological changes in the present case are difficult to explain, especially the generalised lymphatic enlargements, and there are no comparably long-standing cases of lipæmia with which to compare hers. Fatty enlargement of the liver and subsequent portal cirrhosis can be produced regularly in animals by high-fat diets, and I look on her hepatosplenomegaly as a secondary reaction to the lipæmia. Whether the changes in the lymph-nodes, which have puzzled several pathologists, are also reactions to years of lipæmia is unknown, and such a condition passes unmentioned in Drinker and Yoffey's (1941) authoritative book on the lymphatic system. However, they quote experimental work which shows enlargement of lymph-nodes other than mesenteric after high-fat diets, and, on fat-feeding after starvation, a sudden washing away of the cells in the sinuses so that a fine-fibred reticulum is left, a condition reminiscent of the histology in the present case. But as regards the pathological changes, besides some other of her problems,

¶ A new adjective, analogous to glycogenolysis, would be useful. Since "lipolysis" is already used to denote hydrolysis, perhaps "*lipocatabolic*" would be suitable.

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I must end on a note of uncertitude and unsatisfied curiosity.

Summary

A unique case of a young woman is described who, over seven years, developed complete lipodystrophy, a huge liver and spleen, and enlargement of the parotids and all the lymph-glands. Strange metabolic disturbances accompanied this—severe diabetes, intense lipæmia, and an extremely high basal metabolic rate, over +150% of normal.

The pathological findings confirmed complete absence of subcutaneous and retroperitoneal depot fat, and showed portal cirrhosis, duct proliferation in the parotids, and a peculiar dilatation of the sinuses of the lymph-glands. All the endocrine glands were essentially normal, and also the cellular and chemical blood-picture.

Metabolic studies showed a severe "diabetes," unusual in its extreme insulin resistance (maximal control dose 2000 units), absence of ketosis, and normality of the pancreas. The lipæmia was variable (maximum 8%), but the proportion of the various blood lipids remained constant at all levels, and the fat-content of the liver and other internal organs was normal. The lipæmia was independent of dietary fat but directly dependent on the blood-sugar concentration. A high blood-sugar level always led to lipæmia, whereas a low blood-sugar level abolished it. The high metabolic rate (maximum +170%) was not due to thyrotoxicosis, but thyroidectomy reduced the rate to +40%, at which level myxœdema developed.

It is suggested that the lipo-atrophy produced hyperglycæmia and lipæmia in this case by preventing the important action of insulin in changing sugar into stored fat, so that both substances circulated in excess. This aspect of insulin action is supported by other clinical and experimental evidence. The interrelation of carbohydrate fat-metabolism in different types of diabetes is discussed, and it is suggested that some types may be due primarily to disturbances of fat-metabolism produced by other hormonal influences than insulin.

It is impossible to thank by name all who have coöperated keenly in this long study in some difficult years, the nursing staff, house-physicians, and colleagues at King's and elsewhere, particularly Dr. Wilfrid Oakley. I am especially grateful to our biochemist, Dr. C. H. Gray, and to my technical assistant, Mr. H. R. Millar. And finally I would honour the memory of this brave and cheerful patient, so interested and coöperative in all our experiments.

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EPIDEMIC EPIDIDYMO-ORCHITIS IN MALTA

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DURING the summer of 1943 a series of cases of epididymo-orchitis were observed in Malta. They simulated the "non-specific" epididymo-orchitis described in England by Ainsworth-Davies (1943) but differed in that epidemic features were present and fever was invariable at some stage. The fever occurred in two phases: a prodromal fever followed by an apyrexial interval, and then a testicular fever. Demonstrable urinary infection was absent.

CLINICAL MATERIAL

Thirty cases of non-specific epididymo-orchitis without urinary infection are analysed (see table). They were selected because reasonably complete records were available and because they were under the professional care of one or both of us. Many others were treated by unit medical officers, and it is estimated that there were at least 60 cases on the island. The first case appeared in late May, and none was seen after September. One occurred in May, 4 in June, 12 in July, 10 in August, and 3 in September.

During the early stages of the outbreak the condition appeared to be the common primary non-specific epididymo-orchitis, and it was not until the bulk of cases had been seen that records adequate for analysis were kept. Thus valuable information was lost. Moreover, 20 of our 30 patients were admitted primarily for epididymo-orchitis which was already subsiding, and early data on, for example, blood and urinary changes were not obtained.

Age.—Limits 22–44 years. Average 29 years.

Rank.—Officers 18, other ranks 12. The proportion of officers, although higher than in the men, appears greater in this series because both of us were in medical charge of officers, and their records were more complete and personal.

Units.—Royal Navy 2; Royal Air Force 7; Army 21 (including 1 U.S. officer, 2 Maltese, 1 Palestinian, and 1 Mauritian).

Malta service.—There were 2 Maltese officers. Of the remainder, about a third had served in Malta for over 2 years, a third for a few months, and a third for a few weeks. Of the last, all began their first febrile attack more than a week after arrival in Malta.

SYMPTOMS AND SIGNS

Fever.—Twenty-four patients showed a prodromal fever accompanied by symptoms resembling sandfly fever in that there was headache, backache, and anorexia, though conjunctivitis was not prominent. The fever was distinct in 22 and began on the average 11 days (limits 6–21) before the onset of epididymo-orchitis and lasted an average of 5 days (limits 2–14). An apyrexial interval of average 6 days followed, when the patients felt able to carry on their work. In the 2 cases where prodromal fever merged into testicular fever the epididymo-orchitis appeared in the middle of the fever in the one (case 19) and towards the end in the other (case 25).

In 6 cases a similar febrile period, lasting an average of 4 days, preceded the prodromal fever by an average interval of 7 days. In case 17 the illness was characterised by 4 attacks of fever in 2 months, the last attack being accompanied by epididymo-orchitis; the agglutination reactions for *Brucella melitensis* were repeatedly negative.

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The testicular fever developed in 25 cases. The remaining 5 had prodromal fever only. Lasting an average of 4 days (limits 1–11), the testicular fever usually accompanied the testicular swelling, but sometimes epididymo-orchitis developed early or late in the testicular fever. The temperature rose to 100° F in 13, over 100°–101° F in 8, and over 102° F in 4. The pulse-rate followed the temperature, with a tendency to relative slowness. During convalescence from epididymo-orchitis relapses of fever were seen in 2 cases (17 and 18) but were not accompanied by further testicular swelling.

Associated Symptoms and Signs.—Apart from the constitutional upset associated with fever, pain in the loin, iliac fossa, or inguinal region preceded the epididymo-orchitis in 4 cases, and 4 others had such pain coincident with or just after the onset of testicular swelling. Traction pain in the inguinal canal was common when the patient began to get up. Adenopathy was specially looked for in 9 cases seen from the onset. One had cervical adenitis during the prodromal fever, and another generalised adenitis on the 5th day after the onset of the epididymo-orchitis. Three patients complained of pain in the chest (1 patient not in the series had an associated pleurisy), 2 diarrhœa, 1 bronchitis, 1 gingivitis, 1 streptococcal folliculitis, 1 had recently completed treatment for intestinal amœbiasis, and 1 had a T.A.B. injection on the day before the onset.

Local Physical Signs.—The scrotal contents were affected on the left in 21 and on the right in 8 cases. In case 13 the right and then the left side were affected. The local condition varied much. In 2 cases the swelling was huge (cases 2 and 5), in 11 moderate, and in 17 slight. When the swelling was moderate or great, it was difficult to distinguish the epididymis from the testis. The scrotum was red, hot, and swollen and had a glazed look; it was sometimes adherent to the epididymis. The cord was often palpable and thickened. In 22 cases the lesion was an epididymo-orchitis, with usually predominating epididymitis, which was the slower to resolve. In 4 cases the testis alone was affected, but in 4 others, which appeared to be an orchitis only, involvement of the epididymis at some stage could not be excluded on the available information. The acute symptoms resolved in a few days, pain going first, and complete resolution to normal took place in the following times: 1–7 days, 10 patients; 8–14 days, 13; 15–21 days, 2. In the bilateral case (13) resolution was just complete on one side when the other side became affected, and this side resolved completely on the 8th day from the first lesion.

SEQUELÆ

Incomplete Resolution.—The remaining 4 cases did not resolve completely within the observation period. Cases 5 and 8 had a residual nodule in the lower pole of the epididymis at 63 days and 80 days respectively. In case 8 it was difficult at first to exclude tuberculosis, for the epididymis was very craggy. The subsequent course was unlike tuberculosis and he made a good recovery apart from the residual nodule.

Atrophy.—Two patients developed atrophy of the testis. In case 12 it became apparent on the 19th day, and on the 56th day the testis had shrunk by almost two-thirds. A residual nodule was still present in the lower pole of the epididymis. In case 14 the atrophy was noted on the 17th day, and on the 80th day the testis had shrunk also by two-thirds. The sensation in the atrophied testes was altered but not lost. At follow-up examination case 20 had doubtful atrophy.

Relapse.—Some time after discharge 1 patient complained of dragging of the testis, which was found to be slightly larger than normal but not tender. The patient had just noticed this swelling, which was regarded as a relapse, because complete resolution had been recorded on discharge from hospital on the 8th day.

TREATMENT

Even in the minor cases a suspensory bandage was essential. This enabled a few to continue working, but in all cases in this series rest in bed was inevitable. A piece of 'Elastoplast' stretched across the thighs formed a suitable support during the acute stage. On getting up, the patient wore a suspensory bandage until complete resolution had taken place. A dragging sensation persisted for some weeks in several patients, who continued wearing a suspensory bandage with relief. Local heat was not applied, nor were sulphonamides used. Penicillin was not then obtainable.

INVESTIGATIONS

Blood-counts.—Thirty-six blood-counts were performed on 23 patients. During the week following the appearance of epididymo-orchitis 17 patients showed an average white-cell count as follows:

	Average	*Maximum*	*Minimum*
White cells per c.mm.	8310	12,200	4300
Polymorphs (%)	64	76	46
Lymphocytes (%)	29	44	18
Monocytes (%)	5	8	3
Basophils (%)	0·5	1	0
Eosinophils (%)	1·5	6	0

There was a definite tendency to leucocytosis, as the white-cell count in this area is notably lower than in England, and 8 of the 17 patients had lived in Malta for 2 years or more. Half the patients were still febrile at the time of the count. Of the cases tested early in the testicular fever, none showed a leucopenia; the minimal count of 4300 was obtained in a Maltese. During the 2nd week, when all were afebrile, the white-cell count fell by an average of 8892 to 7150 in 6 patients in whom comparison was available; the differential count showed no significant change, only a slight fall in percentage of polymorphs. In 2 patients who were tested during the prodromal fever, the counts were as follows:

Case		*White cells per c.mm.*	*Polymorphs (%)*
21	Prodromal fever	9000	61
	Testicular fever	10,900	55
22	Prodromal fever	6900	78
	Testicular fever	10,800	67

The absence of mononucleosis in any blood-count is much against glandular fever.

Urine.—Of the 30 patients only 2 had urinary symptoms—slight frequency and pain on micturition which lasted 24–48 hr.; neither had any abnormal urinary findings. In the other 28 the urine was unequivocally normal. One of those showed a few fatty casts in the urine, and the other had 7–10 red cells per high-power field without other abnormalities. Admittedly few of the specimens were taken early enough to give every chance of finding transient abnormalities. Culture was not invariably carried out if the deposit was normal.

Prostatic Smears.—Prostatic massage did not reveal any abnormality in 5 cases thus examined.

Tuberculosis Tests.—In case 8 three 24-hr. specimens of urine showed no tubercle bacilli. Five cases underwent radiography of the chest, and 2 had sputum tested; all examinations were negative.

Blood-sedimentation Rate (Westergren).—In 10 cases so tested the records were as expected in any minor febrile illness. The highest reading was 30 mm. in 1 hr.

Melitensis Agglutination.—Twenty-six tests were carried out on 18 patients; all were negative. In 3 patients the test was repeated in 5–8 weeks, and it was

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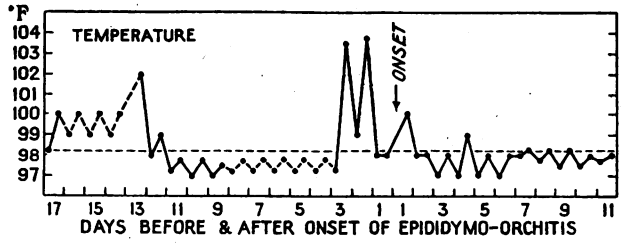
still negative. The suspension used was tested against serum from a known case of undulant fever, and it was found satisfactory.

Weil-Felix Reaction.—Four uninoculated patients were investigated. One English private (case 14) gave a titre to *OX 19*, 80; *OX 2*, 160; *OX K*, 40, on the 8th day, and on the 24th day *OX 19*, 40; *OX 2*, 160; *OX K*, 40. He had no rash or splenomegaly. Another (case 18) tested on the 6th, 13th, and 37th days showed no change in titre: *OX 19*, nil; *OX 2*, nil; *OX K*, 50. The other 2 cases (1 and 8) did not agglutinate *OX 19* but did agglutinate *OX K* at a titre of 40 and 80 respectively. Murine and tick typhus exist in Malta, and it is remotely possible that both those showing titres of 160 may have had at one time subclinical typhus. On the other hand, these titres may have been due to an amnestic reaction. Eleven Maltese controls showed no agglutination in 6 and only 1 of the others had a titre up to 80 (*OX K*). The relapsing type of fever seen in our cases is quite unlike typhus. The Widal reaction was not performed.

Blood-cultures were taken from 3 patients during the testicular fever; all remained sterile after a month.

Blood smears showed no malaria parasites or spirochætes in 6 thus tested. (Malaria is not endemic in Malta.)

Animal Inoculation.—The blood of 1 patient (case 21), who might have had relapsing fever, as judged by temperature charts, was inoculated into a guineapig and a mouse; neither animal showed spirochætes in films taken later.



Temperature chart of case 27 showing prodromal and testicular fevers. The arrow marks the onset of epididymo-orchitis. Interrupted lines indicate febrile and afebrile periods when the patient was not in hospital.

ILLUSTRATIVE CASE-RECORD

To facilitate description the onset of the disease is dated from the appearance of pain and swelling of the testicle.

CASE 27.—Officer, aged 24, with some weeks' Malta service (see figure). Epididymo-orchitis on July 26, 1943. Apart from clinical enteric in 1941 he was well until 17 days before epididymo-orchitis, when he became feverish. Malaise and

PRINCIPAL FEATURES OF EPIDEMIC EPIDIDYMO-ORCHITIS

Case	Age (yr.)	Malta service (months)	Prodromal fever	Testicular fever (days)	Resolution (days)	Side affected	White cell in acute phase (per c.mm.)	Other complaints	Sequelæ and date
1	24	36	Yes	4	8	Left	6800	..	Enlarged testis 2 months later
2	25	18	No	1	12	Left	..	Pain in chest and loin	..
3	34	2	Yes	4	7	Left	4500	Healed amœbic dysentery	..
4	25	12	Yes	2	10	Right	6600	Pain in R iliac fossa	..
5	22	24	No	4	(21)	Left	10,050	Pain in L iliac fossa	Nodule in epididymis 9 weeks later
6*	33	5	Yes	2	15	Left	5750	..	..
7	22	6	No	2	4	Left	6400	..	..
8	28	7	No	11	(10)	Left	7700	..	Nodule in epididymis 11 weeks later
9	24	5	Yes	3	13	Right	7800	..	..
10	44	24	Yes	4	15	Left	5300	Staphylococcal folliculitis	..
11	38	36	Yes	3	8	Left	7000	Pain in chest	..
12	27	24	Yes	Nil	(19)	Right	8000	T.A.B. day before	Atrophy of testis
13	30	3	Yes	8	8	R and L	8800	Sore gums	..
14	26	42	Yes	1	(12)	Right	12,050	..	Atrophy of testis
15	38	1	Yes	Nil	6	Right	..	Pain in R iliac fossa	..
16	26	1	Yes	3	9	Right	12,200	Pain in chest and hypogastrium	..
17†	26	Life	Yes	5	9	Left	8900	..	Slight relapse for 6 days 1 month later
18	22	1	No	3	7	Left	8200	Glands 5th day	..
19	27	1	Yes	10	6	Left	9000	..	..
20†	35	Life	Yes	4	10	Left	4300	..	? atrophy of testis 3 months later
21	30	33	Yes	10	9	Left	10,900	..	Nil 6 weeks later
22	25	24	Yes	1	7	Right	10,800	Bronchitis	..
23	35	1	Yes	Nil	21	Left	..	Pain in L lumbar region	..
24	27	1	Yes	2	10	Left	10,300	Diarrhœa	..
25	44	7	Yes	3	5	Right	..	..	..
26	23	1	Yes	Nil	4	Left	..	Glands and diarrhœa	..
27	24	1	Yes	4	4	Left	4500	Pain in abdomen	..
28	22	24	Yes	3	13	Left	..	Pain in left groin	..
29‡	23	6	No	3	7	Left	..	..	..
30	31	1	Yes	Nil	12	Left	..	..	..

Cases 5, 8, 12, and 14 did not resolve completely within initial period of observation; figures in parentheses represent days of observation in hospital. * Mauritian † Maltese ‡ Palestinian

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slight headache. On the 5th day of that prodromal fever he was admitted; temperature 101·8° F, but 99° F next day. On the 10th day before epididymo-orchitis he complained of pain across the chest, which lasted for a week. No physical signs were found, and he remained afebrile for 8 days. Three days before the appearance of a testicular swelling he had abdominal pain and temperature 103·5° F. No urinary symptoms and no physical signs. Epididymo-orchitis appeared on the 4th and last day of this bout of high fever, at the peak of which he had a rigor and vomiting. The left testis was painful, swollen, and tender, and the epididymis less so. Improvement was rapid, and all signs had disappeared 4 days later.

White-cell count on day before epididymo-orchitis 4500 per c.mm. (polymorphs 75%). Blood-culture negative on day before epididymo-orchitis. Urine on 1st day normal. Melitensis agglutination negative on day before epididymo-orchitis.

In this case epididymo-orchitis appeared late in the second bout of high fever, which resembled sandfly fever.

DISCUSSION

The ætiology of epididymo-orchitis is usually divided into specific—gonococcal or tuberculous—and non-specific, which is further subdivided into primary and secondary—i.e., secondary to infection of the urinary tract. This classification is unsatisfactory, because a *Bact. coli* epididymo-orchitis should surely be called specific. However, the terminology hitherto accepted is retained for convenience.

During recent years the incidence of non-specific epididymo-orchitis appears to have increased both absolutely and relatively to specific epididymo-orchitis. Robinson's (1943) series of 50 cases of epididymo-orchitis included 24 non-specific cases. The *Army Medical Department Bulletin* (1943) stated that of 680 cases of epididymitis 79 were diagnosed as gonococcal and 19 as tuberculous, and in 582 the cause was not specified. The incidence varies with the community. In the civil series tuberculous cases predominated over gonococcal cases, whereas the reverse is true of the Army series.

Subdivision of non-specific epididymo-orchitis has appeared late in the published work. Slesinger's (1943) series of 34 cases includes 12 (35%) associated with urinary infection. Ainsworth-Davies's (1943) series of 58 cases includes 21 (36%) secondary cases, whereas in the 582 cases reported in the *A.M.D. Bulletin* as not having had a cause assigned to them the records of 18% contained evidence of genito-urinary infection. These percentages largely depend on the criteria of diagnosis of urinary infection. Organisms grown from urine culture are often contaminants in ordinary midstream specimens, and the number of pus-cells per high-power field of a centrifuged urinary deposit constitute an uncertain criterion, especially in dilute urines. Urine culture tends to indicate infection too often, and urinary deposits not often enough. Frequency of micturition is a poor guide, for it may be simply reflex from epididymo-orchitis, but terminal painful hæmaturia is more reliable evidence. Robinson (1943) mentions it as a symptom in 2 of his cases, and we observed it in 4 cases which were relegated to the non-epidemic group. The inguinal pain experienced in epidemic cases suggested a descending infection.

Slesinger (1943) points out that venereal non-gonococcal infection of the urethra and prostate may sometimes be a cryptic cause of non-specific epididymo-orchitis, so careful examination of the prostate and microscopy of prostatic smears and of early-morning urinary deposits are indicated. A focus in the prostate or urethra is more likely to be overlooked than one in the kidneys or bladder. Infection of the upper part of the urinary tract is rarely associated with non-specific epididymo-orchitis, which then develops late, and the urinary symptoms persist.

In the present series, cases with any suspicion of infection of the urinary tract were rigidly excluded, and the series is therefore comparable with that described by Ainsworth-Davies (1943). His description would apply to many of our cases:

"The attack begins with pain in the groin and lower abdomen and is soon followed by pain and swelling of one side of the scrotum. There is usually some fever, and the patient looks and feels ill. The scrotum is red and œdematous and is often adherent to the epididymis behind and below. The whole epididymis is swollen and very tender. The testis is difficult to palpate because of the pain, but is of normal size. A small degree of hydrocele is present. The cord is swollen, hard, tender, and it is difficult to feel the vas. The attack reaches its height about the fifth day and gradually subsides in about ten days, leaving some thickening of the globus minor which is tender on palpation. Suppuration never occurs."

That we were dealing with a definite clinical group not covered by previous writers was brought out by the prodromal fever and the evidence suggesting an epidemic in some units—5 cases occurred in one artillery H.Q. company in 10 days. At one period—August—men expected to wake up with testicular pain and swelling, popularly called "Malta testicle." Similar cases, but with evidence of urinary infection, were observed in Malta during the summer of 1943. They were, however, nothing like so numerous as the non-specific cases described.

The ætiology of primary non-specific epididymo-orchitis is varied: minor trauma; strain causing regurgitation of sterile urine down the vas (Slesinger 1943); erotic congestion; minor vascular changes; and blood-borne infections from foci in teeth, tonsils, or skin. There was no constant evidence in the present series of any such factor. Orchitis is a recognised complication of mumps, malaria, filariasis, smallpox, meningococcal meningitis, choriomeningitis, Börnholm disease, glandular fever, atypical pneumonia, and enteric, undulant, and sandfly fevers. The pathological and clinical findings excluded all the above save sandfly fever. An epidemic of enteric fever (*Bact. typhosum*) broke out among the civil population in the summer of 1943, but none of the Service cases, totalling about 40, had evidence of epididymo-orchitis. The 4 cases quoted from Bailey (*A.M.D. Bulletin* 1943) were from 2500 cases of enteric, and all 4 had an associated bacilluria due to *Bact. paratyphosum B*.

Undulant Fever.—Hughes (1897) said in his book on Malta fever that 5% of cases were complicated by epididymo-orchitis as a late symptom during relapses after apparent convalescence:—

"The testis and epididymis swell in 24 to 48 hours to the size of a small orange and are very painful and very tender. There may be some redness of the skin and effusion into the tunica. The acute inflammation usually subsides in a few days leaving the organ hard and tender. Gradually the hardness disappears and the normal condition is returned to, but this often takes a considerable time. A certain amount of pyrexia proportionate to the acuteness of symptoms accompanies the attack."

Admittedly this description is not unlike that of our cases, but frequent agglutination tests were consistently negative in our series, which showed none of the characteristics of Malta fever, though we were constantly on the look-out for these.

Sandfly Fever.—Epididymo-orchitis is an accepted complication of sandfly fever, but its incidence has not been recorded. Maltese doctors recognise epididymo-orchitis as an occasional complication of the local brand of sandfly fever that is apt to relapse. In the summer of 1943 sandfly fever began in May, when the first case of our series was noted, and the last case of epididymo-orchitis was seen at the end of September, when sandfly fever was fast ebbing. In one hospital alone some 500

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cases of sandfly fever were treated during that period, and about 20 cases of epidemic epididymo-orchitis were seen. Should epidemic epididymo-orchitis be established as a complication of sandfly fever, its incidence would be 4%.

Against a sandfly ætiology for our cases is the fact that epididymo-orchitis had not appeared as a complication in previous years, nor has it ever been common in other countries ridden with sandflies. However, in endemic diseases a special complication may appear from time to time—e.g., the gastro-intestinal form of malaria—and it might be argued that we were dealing with a gonadotropic strain of sandfly fever. But sandfly fever is a leucopenic disease, shown by the average white-cell count of 5222 per c.mm. in a sample of 30 cases observed during the same summer. Two-thirds of those cases had under 5000 white cells per c.mm. In contrast the patients with epididymo-orchitis showed a small leucocytosis. A simple complication such as epididymo-orchitis should not materially alter the blood-picture of sandfly fever.

The fever did not always resemble that of sandfly fever in our epidemic series. One had bronchitis and others diarrhœa, and in several the fever lasted much longer than is usual in sandfly fever. Unfortunately no reliable criteria are available for the diagnosis of sandfly fever, and a short pyrexia of unknown origin associated with headache and backache was usually labelled sandfly fever. Admittedly physicians were fever-conscious in the Mediterranean area, and it may be that influenza or even simple coryza in England takes the place of short-term fevers met here. This point needs investigation. If such infections in fact commonly precede non-specific epididymo-orchitis in England, then the evidence for bringing our cases into a special group is less convincing.

SUMMARY

A non-specific epididymo-orchitis developed in epidemic form among Service personnel in Malta during the summer of 1943.

The cases were characterised by a short prodromal fever, an apyrexial interval of 6 days, followed by a second, testicular, fever lasting 4 days. This testicular fever was accompanied by unilateral testicular swelling, which subsided considerably during the first week, leaving residual swelling, which usually resolved within a month.

The local physical signs indicated an epididymo-orchitis with greater stress on the epididymis.

Though complete recovery was the rule, the epidemic caused substantial invalidism during the summer. Atrophy of the testis followed in 2 patients, and another showed doubtful atrophy.

The ætiology of the condition—a primary (non-specific) epididymo-orchitis—is discussed. We found insufficient evidence to incriminate either a gonadotropic strain of sandfly fever or undulant fever as the cause of the epidemic.

Our thanks are due to Brigadier W. K. Morrison, D.S.O., then D.D.M.S., Malta Command; Brigadier Evan Bedford, consulting physician; Brigadier Sydney Smith, consultant in tropical medicine; Brigadier R. Lees, consultant in venereology; Lieut.-Colonel M. Fallon, R.A.M.C.; Major J. Jamieson, R.A.M.C., D.A.D.P.; Majors K. Harrison, T. Elliott, and W. R. Morton, R.A.M.C.; and Squadron-Leader A. J. Currie for their interest and help in discussing cases; and to Captain J. Kay, R.A.M.C., who was in charge of a ward for cases of epididymo-orchitis.

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NON-SPECIFIC EPIDIDYMITIS

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NON-SPECIFIC epididymitis is not a sharply defined entity. Its incidence is as high as its ætiology is puzzling; the *Army Medical Department Bulletin* (1943) reported that in a six-month period there were 680 cases in Army records, of which 79 were diagnosed as gonococcal and 19 as tuberculous, while in 582 the cause was unspecified.

Non-specific epididymitis includes those inflammations of the epididymis which cannot be ascribed to known specific causes—e.g., tuberculosis, gonorrhœa, undulant fever (Isaac 1938), typhoid fever (Webb-Johnson 1919), mumps (McElligott 1943), meningococcal septicæmia (Laird 1944), smallpox (Rolleston and Ronaldson 1940), and possibly influenza (Boyd 1922)—or to the rare injury or vascular accident which affects chiefly the epididymis (McGavin 1939, McLachlan 1943). I hope to add evidence to the view that cases of epididymitis, though they may not form a homogeneous group, are nearly always due to infection by various bacteria which normally live in the body—coliforms, diphtheroids, streptococci (especially *Strep. fæcalis*), and staphylococci, either singly or in combination.

I have been stimulated to record the following small series of 30 cases by Laird's (1945) paper, recording 102 cases treated in a venereal clinic, because Laird has suggested that surgeon and venereologist may "meet with different cross-sections of the total group of patients" with non-specific epididymitis. He has reported results so different from my own that I think the patient with an acute or subacute epididymitis, especially if there is a recent history of venereal disease, gravitates naturally to the venereologist; whereas the more chronic case suggest stuberculosis and is therefore sent to the surgeon.

PRESENT INVESTIGATION

The cases which form the basis of this paper were admitted for investigation of epididymitis to the surgical divisions of various military hospitals during the past three years. Of the 30 cases, 4 were tuberculous, 1 gonococcal, and 1 malignant, leaving 24 non-specific. A special proforma was instituted, and, though it was not uniformly complete owing to frequent interruption by more urgent surgical business, analysis of the 24 "non-specific" case-sheets yielded the following information.

History.—The average age was thirty years. The average time between onset and admission to hospital was ten days, and the average stay in hospital was twenty-seven days; 6 men had had previous similar attacks, and 3 admitted previous venereal disease. Only 9 complained of considerable pain; 4 had frequency of micturition, and 1 hæmaturia.

Clinical Findings.—The right epididymis was affected twice as often as the left. The lower pole was the part chiefly affected in 12 men, the whole organ was swollen in 7, the upper pole in 1, the mid-zone in 1, and the exact site was unrecorded in 3. Two-thirds of the patients showed thickening of the spermatic cord on the affected side without beading. Definite hydrocele was not seen, and frank suppuration occurred once. Rectal examination was considered dangerous in the early stages and was not done until the disease appeared quiescent; nevertheless the prostate or the vesicle was felt to be enlarged and hard in 10 cases, 4 of them on the contralateral side.

Special Investigations.—The urine was sterile in 8 cases, sterile with pus-cells in 2, and infected in 11 (3 unrecorded). The organisms grown were *Bact. coli*, *Strep. fæcalis*, diphtheroids, *Staph. hæmolyticus*, and *Staph. albus*. The examinations of 24-hour samples of the urine for tubercle bacilli were all negative. Prostatic

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smears, taken when inflammation appeared quiescent, were obtained from 13 men; 3 showed pus-cells only, and 8 showed pus with organisms, coliforms, diphtheroids, and gram-positive cocci being seen. The gonococcal complement-fixation test (in 14 cases) and the Wassermann reaction (in 19 cases) were uniformly negative. The erythrocyte-sedimentation rate (Westergren) was normal in 14 cases, over 15 mm. in 4 cases, and over 40 mm. in 2. The white-cell count was normal in 5 men, over 8000 per c.mm. in 8, and over 12,000 in 5 cases. Radiographs of the chest (in 14 men) and intravenous pyelograms (in 8) were all normal. Posterior urethroscopy was done in 13 cases shortly before their discharge from hospital, and signs of infection—i.e., polypoid tags, injection, and œdema—were seen in 8. No harm appeared to result from the rectal examination or urethroscopies except in one man with chronic prostatitis, who, it was thought, was brought within the scope of this investigation by over-enthusiastic prostatic massage.

Treatment.—The earlier cases were treated with sulphanilamide or sulphathiazole (6 g. daily for five days). These drugs seemed to have very little effect on either the swelling or the pain and they were abandoned. The later cases were treated with penicillin 100,000 units daily for 5–10 days. This, though it seemed not to affect the swelling, relieved pain within twenty-four hours in most cases. In 2 cases in which the swelling remained stationary and the diagnosis was in doubt epididymectomy was performed, which added many days to the convalescence. In 2 cases not included in the present series incision of the epididymis through the scrotum was tried but seemed to retard rather than expedite cure. The most valuable method of treatment was rest, for the patient by confining him to bed, for the affected part by a subscrotal sand-bag or a suspensory bandage.

Results.—Most of the patients on discharge from hospital showed residual thickening of the epididymis, often in the form of a hard elastic nodule the size of a pea in the lower pole. In only 3 men did the epididymis return to normal.

One man was discharged from the Army; he had had twelve attacks of epididymitis, right, left, and bilateral, and was admitted with a sinus leading to an enlarged right epididymis. The left testis had been removed elsewhere two years previously, and section had shown no sign of tuberculosis. Very full investigation, including biopsy of the sinus, gave no evidence of tuberculosis, and he was invalided on a diagnosis of non-specific epididymitis.

Histology.—The two specimens of the epididymis removed at operation were cut in half. One half was cultured and was sterile in both instances. The other half was sectioned and the histology found to differ. In both specimens there was great increase of fibrous tissue. In one the duct epithelium was hyperplastic in some areas and showed cystic dilatation in others, and there were extensive collections of granulation tissue round the ducts; concentric whorls of fibrous tissue surrounded the granulation tissue, and some ducts contained desquamated epithelial cells and polymorphs. The other specimen showed ducts of almost normal appearance containing chiefly desquamated epithelial cells, and its main features were massive fibrosis and occasional areas of granulation tissue.

DISCUSSION

In the present series direct evidence of prostatic or vesicular infection was not sought until the infective process appeared quiescent. Nevertheless only 4 patients gave normal results to rectal examination, prostatic smear, and posterior urethroscopy, and 3 of these had pus, or pus and organisms, in their urine. This indicates that epididymitis is associated with prostatitis in most cases; and with genito-urinary infection in the vast majority. To put the matter in another way, only 5% of cases of epididymitis in this series did not show evidence of genito-urinary infection. It is fair to infer that most examples of non-specific epididymitis are secondary to infection of the prostate or vesicles (though the evidence would not confute anyone who maintained that the prostatitis was secondary to the epididymitis). This view is not new and has recently been supported by McElligott (1943), Schnitzer (1944), Laird (1945), and others.

It has been maintained, notably by Slesinger (1943) and McGavin (1943), that many cases of epididymitis are caused by the entry of sterile urine into the vas during straining efforts. This theory receives no support from the present investigation; indeed it seems improbable that a fluid which excites no inflammation in a membrane so sensitive to chemical insult as the bladder should cause severe and often permanent changes in the epididymis.

Carious teeth and other forms of chronic sepsis are quoted as primary foci for blood-borne infection. Bowen's (1933) sixth case was undoubtedly so caused, and Ainsworth-Davis (1943) believes that *Bact. coli* may thus be carried from the colon. But such infections must be the exception rather than the rule. The prostate is the usual primary focus.

The method by which non-specific infection reaches the prostate is a matter for controversy, even among those who consider prostatitis the precursor of epididymitis. Some patients were questioned about their recent sexual activities in an attempt to show that non-specific urethritis was the cause: 2 men denied ever having had intercourse, 7 said they had had intercourse with their wives from one to twenty weeks previously, and 9 admitted intercourse with other women from three to eight weeks previously. All denied recent urethral discharge. Though this evidence is not convincing, partly owing perhaps to the difficulty of reaching the truth in matters so private as an individual's sex life, I believe that the prostatitis is caused by a mild non-specific urethritis of venereal origin or is a secondary infection of a gonorrhœa which has been cured or has died out. It has been contended that lack of personal cleanliness may cause prostatitis via the urethra. If this were so, it would be expected that troops in the field would be more often affected than those at the base; in fact the reverse appeared to obtain. Primary blood-borne non-specific prostatitis no doubt arises from the same causes as primary epididymitis, but there is no reason to suppose that it is common.

The histological evidence, based on 2 cases, is too scanty to justify conclusions. The duct epithelium was less affected than the stroma. One section showed branching lines of inflammatory cells, similar to the appearances in a lymphangitis of the dermis. The contents of the ducts in one case were mainly desquamated epithelial cells, in the other pus-cells and epithelial cells in approximately equal numbers. These findings, together with the frequent clinical funiculitis, do no more than suggest that infection may travel from prostate to epididymis by the lymphatics of the cord rather than by the lumen of the vas. The normal-looking ducts set in dense fibrous tissue, seen in 1 case, seem to show that infection by no means always ruins the epididymis as a conducting mechanism.

The two chief points in the management of non-specific epididymitis are to exclude tuberculosis and to ensure rest. Radiography of the chest and three examinations of 24-hour specimens of the urine are essential. Rest, both local and general, is ensured by putting the patient to bed and supporting the scrotum. Laird's (1945) observations make it clear that a course of a sulphonamide should always be given, though it will probably benefit only those who have a cryptic gonorrhœa. Penicillin may relieve pain but is unlikely to affect swelling. Diathermy is said to be a valuable adjunct. A fortnight's conservative treatment should show a very considerable

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diminution in the swelling of the epididymis; if this does not occur, the testis should be inspected through an inguinoscrotal incision. When doubt still remains, an epididymectomy should be done. Exploratory operation will occasionally reveal unsuspected malignant disease, as happened once in this investigation, when a man with six months' history of pain and swelling in the epididymis following an attack of cystitis was explored. Section of the mass at operation, after a Doyen's bowel clamp had been put across the cord, showed a seminoma the size of a thumb-nail bulging into the epididymis.

SUMMARY

Non-specific epididymitis is usually secondary to infection of the prostate or the vesicles.

The prostatitis or the vesiculitis is probably a result of non-specific venereal urethritis, or the residue of a healed gonococcal urethritis.

The conducting function of the epididymis may survive the infection.

Complete resolution is unusual.

Treatment is by rest. A course of a sulphonamide should be given but often does not affect the disease.

Tuberculosis must be carefully excluded in all cases.

When the epididymal swelling does not appreciably diminish in fourteen days, the testis should be explored at operation.

My thanks are due to many R.A.M.C. officers who have helped me to collect information, especially to Major T. Crawford for his work on the pathology in more than half the cases. I am indebted to the Director-General, Army Medical Services, for permission to use the material.

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HYPERPLASIA OF SEMINAL VESICLE CAUSING ENURESIS

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THE effects of hyperplasia of a seminal vesicle on micturition do not appear to be appreciated. It can hardly be a condition of great rarity, as 3 cases have occurred in my own practice.[1] This suggests that the lesion is not being recognised. It is to draw attention to the early complications of this condition before retention of urine arises that this case is published.

An unmarried soldier, aged 28, was admitted on May 8, 1945, with enuresis.

He had been brought up in a children's home, as he was left without relations as a baby. He had enuresis until the age of 8 years, when the condition cleared after circumcision. He joined the Regular Army in 1936 and had an occasional recurrence of the enuresis in India in 1937 after an attack of fever. The enuresis has been intermittent ever since until early in 1945, when it became worse, and in April frequency of micturition developed, necessitating urination a dozen or more times in the day and three times at night. The nervous strain of warfare made absolutely no difference to the condition. He denied having had venereal disease. In April, 1945, he was sent for investigation, and the findings given below confirm those of the military authorities, a teaching hospital, and an E.M.S. hospital

On examination he was a well-built physically fit man, and the only positive finding was on rectal examination, when a long nodular mass was palpable on the left lobe of the prostate extending upwards to the base of the bladder.

Investigations (May 10).—A blood-count showed red cells 6,280,000, Hb 122%, colour-index 0·97, and white cells 7900 (neutrophils 56%, eosinophils 5%, basophils 1%, monocytes 1%, lymphocytes 37%). Blood sedimentation-rate 2 mm. in 1 hour. Non-protein nitrogen 38 mg. per 100 c.cm. Wassermann reaction negative.

A rubber catheter passed easily, and a catheter specimen of urine on May 12 showed, in a direct film, a heavy deposit of amorphous phosphates; no pus cells, red blood corpuscles, casts, tubercle bacilli, or gonococci. On culture a few colonies of *Staphylococcus albus* were obtained after aerobic cultivation at 37° C.

Radiography (May 11) of lumbosacral spine showed the lumbar region normal, but an incomplete fusion of the 1st sacral spinous process. An intravenous pyelogram showed excretion normal, and no abnormality was detected.

Cystoscopy was performed under spinal anæsthesia ('Stovaine' 1 c.cm.). Lumbar puncture fluid appeared normal. Urethra: normal. Bladder: normal in capacity but showed trabeculation, and the trigone was raised on the left side by a submucosal mass, which ran from the region of the verumontanum upwards, outwards, and to the left, through the internal urinary meatus to a little distance short of the left ureteric orifice, and raised a fold of mucosa which ran up the left lateral wall of the bladder. The provisional diagnosis was hypertrophy of a seminal vesicle.

Operation (May 18).—Spinal anæsthesia ('Nupercaine' 1/1500, 14 c.cm.). Midline suprapubic cystotomy. The cystoscopic findings were confirmed, and the mass (2·5 × 1 × 1 c.cm.) was excised by diathermy. A de Pezzer catheter was inserted and the wound loosely sutured. On the 26th the de Pezzer catheter was removed. On June 7 the wound was dry, but there was a slight thickening of the globus minor of the right testicle. The patient got up on the 11th, and on the 26th cystoscopy, under spinal anæsthesia (stovaine 1 c.cm.), showed a normal condition. On July 11 the patient was discharged symptomless.

Pathological report (May 22): hyperplasia of seminal vesicle.

In my two earlier cases[1] the patients were admitted to hospital with retention of urine.

The first patient, aged 40, had had difficulty in micturition for several weeks some two years before admission, and intermittent attacks of frequency for eight months. Rectal examination showed an elongated soft swelling running up the centre and slightly to the right of the midline of the prostate, well up behind the base of the bladder. Cystoscopy was unsatisfactory owing to hæmorrhage. At operation the prostate and an enlarged right seminal vesicle were removed, the latter being the mass felt per rectum.

The second patient, aged 18, had been in another hospital with retention of urine fifteen months, and again eight months, before admission, and had had attacks of difficulty and frequency several times since the first onset of retention. On admission he had retention with overflow. Rectal examination showed a soft fusiform mass lying posterior to and running above the prostate. Cystoscopy showed a pale raised area at the base of the bladder running from the urethra towards the left ureteric orifice. This mass was removed at operation and found to be a hyperplastic left seminal vesicle. These two patients have remained symptomless for nearly six and four years respectively.

I wish to thank Mr. S. R. Adlington for sending this case to me, Dr. H. E. Harding for the pathological report, and Dr. J. Rennie and Dr. J. Clark for allowing me to report it.

1. Chesterman, J. T. *Brit. J. Urol.* 1942, **14**, 174.

Dr. WILLIAM H. FELDMAN, of the Mayo Foundation, has accepted the invitation of the Royal Institute of Public Health and Hygiene to be the Harben lecturer for 1946. His subject will be the Chemotherapy of Tuberculosis, including the Use of Streptomycin. The addresses will be delivered at the institute, 28, Portland Place, London, W.1, at 3 P.M. on July 15, 16, and 17. Seats will be reserved on application to the secretary.

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Reviews of Books

Microanalysis in Medical Biochemistry

E. J. KING, M.A. McMaster, PH.D. Toronto, professor of chemical pathology in the University of London at the British Postgraduate Medical School. London: J. & A. Churchill. Pp. 168. 10*s.* 6*d.*

THIS excellent textbook on micro-analysis in biochemistry reproduces in book form the various methods Professor King has described in papers during the past eight years. The analyses include those for whole blood, plasma, cerebrospinal fluid, fæces, urine, gastric contents, and calculi. One chapter is devoted to gastric, renal, and liver function tests, and another, most useful, chapter to colorimetric and photometric measurements. A table of normal values and abnormalities in composition of human blood serves as a worthy preface to the chapters on the various types of analyses.

Clinical Biochemistry

(3rd ed.) ABRAHAM CANTAROW, M.D., professor of physiological chemistry, Jefferson Medical College; MAX TRUMPER, PH.D., lieut.-commander, H(S), U.S.N.R., Naval Medical Research Institute, National Naval Medical Center, Bethesda, Md., formerly in charge of the laboratories of biochemistry at the college. London: W. B. Saunders. Pp. 646. 32*s.* 6*d.*

THE 25 chapters of this book cover the metabolism of carbohydrate, protein, lipid, calcium, and other minerals; the various tests of hepatic, renal, gastric, and pancreatic function; vitamins; diabetes mellitus; and hormone assay and endocrine function, described by a special contributor. Carbohydrate metabolism is dealt with in great detail, and the concept of a renal threshold is clearly explained, but only 20 pages are given to calcium metabolism, and the abnormal calcium excretion in hyperthyroidism is dismissed in a sentence that "it appears to be due to a direct stimulatory catabolic effect on the calcium deposits in the bones." This is difficult to reconcile with the fact that the serum calcium in hyperthyroidism is below normal. The chapter on renal function with the various methods of investigation is clear and very comprehensive, as is the description of liver function tests. Each chapter has a bibliography and the number of references in all exceed a thousand; but over 90 % are American, and this means that some of the English work on clinical biochemistry is omitted.

Protozoology

(3rd ed.) RICHARD R. KUDO, D.SC., professor of zoology, University of Illinois. London: Baillière. Pp. 778. 44*s.*

THIS book, covering all protozoa whether free-living or parasitic, is chiefly intended for students whose interest extends beyond the types responsible for disease in man and animals; but in this edition Professor Kudo has increased its value for doctors by devoting more space to the human parasitic protozoa. New chapters deal with the major groups of protozoa, and with methods of collecting, cultivating, and preparing protozoa for study and observation. There are four coloured plates of the four species of human malarial parasite as seen in blood films, and 336 other figures containing 2741 separate illustrations, most of them depicting individual species. The book thus makes it easy to identify most free or parasitic protozoa, and references are given for those who wish to follow up any organism in greater detail.

Nitrous Oxide-Oxygen Anæsthesia

(2nd ed.) F. W. CLEMENT, major, M.C.(A.U.S.), formerly director of anæsthesia, Flower Hospital. London: Henry Kimpton. Pp. 288. 22*s.* 6*d.*

THE name McKesson is respected by every anæsthetist: his pioneer work on the use of nitrous oxide in major surgery is a landmark. Major Clement, McKesson's partner for years, expounds lucidly in this book their viewpoint on anæsthesia, with particular reference to technique with the McKesson gas-oxygen machine. The second edition shows that the former uncompromising routine use of nitrous oxide-oxygen alone, for every operation of surgery—even though it meant the employment of heroic manœuvres like secondary saturation—has given way to a more balanced view. The reader is urged to supplement nitrous oxide with more potent anæsthetics rather than to use anoxia as a means of subduing the patient. In an interesting new chapter nitrous oxide is defended against the critics who find it difficult to reconcile the term "non-toxic" with the known effects of anoxia. This book must be read widely, if only because it represents the latest views of McKesson's associates.

Synopsis of Obstetrics and Gynæcology

(9th ed.) ALECK W. BOURNE, M.A., M.B. Camb., F.R.C.S., F.R.C.O.G., obstetric surgeon to St. Mary's Hospital, London. Bristol: John Wright. Pp. 500. 21*s.*

THIS latest edition has been thoroughly revised. Additions have been balanced by suppressions, and the use of thin paper has reduced the total pocket volume—a great advantage to students who carry it for reference in odd moments. Being full of meat, it will appeal not only to final-year students but to qualified men who want a quick handy reference or to registrars who have to teach students. In a work which, as the author says, conforms to the current opinion of teachers and examiners it is hard to find anything to criticise. Perhaps too much space is given to symphysiotomy and pubiotomy, which are only of historic interest. And if Mr. Bourne must use an unabsorbable suture in the classical operation for sewing up the wound in the uterus, silkworm gut plus thread seems a curious choice—especially as he does not despise catgut in the lower-segment operation. Finally, is it really true that parturient women tolerate chloroform well? But these are minor objections to a work that has long inspired affection and respect.

Year Book of Industrial and Orthopedic Surgery 1945

Editor: CHARLES F. PAINTER, M.D., orthopædic surgeon to Massachusetts Women's Hospital and Beth Israel Hospital, Boston. Chicago: Year Book Publishers. London: H. K. Lewis. Pp. 432. 18*s.*

THIS carefully compiled and well-illustrated collection of abstracts from the medical presses of the old and new worlds has also been carefully and lucidly written; so the articles do not leave the reader with the feeling that he must refer to the originals for more details. The diversity of subjects reflects the wide scope of modern orthopædics. The arthroses still produce many articles, but no certain claims for successful treatment. Gold therapy is regarded with some respect, but its dangers are now fully appreciated, and its use much more restricted. The articles on penicillin and chemotherapy in bone and joint disease already seem dated. New methods of fracture treatment are fully reported, most of them being conservative. In treatment of "low back-pain" and the prolapsed disk a more conservative attitude is likewise evident. A section on industrial medicine shows the position in Canada and the United States, and suggests lines of development which we might follow here.

Physical Diagnosis

(3rd ed.) RALPH H. MAJOR, M.D., professor of medicine in the University of Kansas. London: W. B. Saunders. Pp. 444. 25*s.*

FIRST published in 1937, this book rapidly became the standard work in English. Steering a course between the encyclopædic treatises of the Teuton and the scanty pamphlets of the generation reared on a mixture of "clinical science," radiology, and biochemistry, Professor Major covered in one volume of reasonable size the essentials of physical diagnosis, going back to original sources for his descriptions of physical signs. Only trifles call for criticism. For example, few clinicians would agree that the blood-pressure can be measured more accurately by palpation than auscultation, and the antiquated method of differentiating splenic from renal enlargement by inflating the colon with air does not deserve two illustrations. The index and many of the cross-references to illustrations need revision, and the illustrations might well be pruned and supplemented.

Clinical Parasitology

(4th ed.) C. F. CRAIG, M.D., F.A.C.P., emeritus professor of tropical medicine, Tulane University of Louisiana; E. C. FAUST, M.A., PH.D., professor of parasitology in the university. London: Henry Kimpton. Pp. 871. 50*s.*

THIS latest edition has been revised and enlarged. Clear, comprehensive, and well illustrated, it remains in the first rank as a textbook for the medical biologist called upon to deal with the parasitic and insect-borne infections of man.

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THE LANCET

LONDON: SATURDAY, MAY 25, 1946

"The Minister"

A CERTAIN artificiality has marked the opening phase of the committee stage of the Health Bill. Much of the discussion has been on the familiar theme of how to ensure that the Minister really does consult his advisory bodies, and yet at the same time has the discretion needful if the executive machinery is to do its work. The debates have been important and useful, and have drawn from Mr. BEVAN various expressions of good intention. Nevertheless we are left with a feeling that the machine is still capable of running away with "the Minister" and in so doing could seriously interfere with the freedom of experimental development which is the most valuable feature of the present hospital and medical services. In anticipation of the further stages in committee and upon report we suggest that two features of the Bill demand special attention.

First, the powers of regulation and direction. In clause 12, for example, the functions of the regional boards, of the hospital management committees, and of the boards of governors of teaching hospitals are hedged about with the formula "in accordance with regulations and such directions as may be given by the Minister." While admitting that he must have powers of defining and delimiting the functions of the different bodies, it is proper and necessary to press the question "how far do his powers go?" As they stand, do not these provisions of the Bill open the way to directions as to the manner in which this and that particular objective is to be attained? To be more specific, do they not empower "the Minister" to issue directives—of the type already familiar in the Emergency Medical Service and the medical branches of the Armed Forces—indicating the manner in which some particular class of case is to be treated? It would presumably be in order for the Minister, on the advice of one or more of his permanent staff, to direct that, say, fractures should be treated in such and such a way and not as heretofore. Few would deny that valuable progress can be stimulated by such directives, and the good of patients promoted. Nevertheless the principle involved has grave implications, since power of this kind, if used conservatively, would hinder the development and establishment of new and better techniques and take all heart out of potential pioneers. The provision for directions applies even to the boards of governors of teaching hospitals; so these too could come within the scope of such edicts, despite their special need to exercise their own discretion. If the Minister can show that such an interpretation of his powers is wide of the mark, well and good. But the clauses as drafted appear to leave a primrose path wide open.

What is the remedy? How can the necessary safeguards be incorporated in the Bill? Presumably it will be one of the main objects of the Central Health Services Council to keep guard against infringement of medical freedom. But if that body proves effective and active it might itself become the arbiter of what is medically sound and what is not; while if it does not become an effective body the position will be even less defensible. This is one of the crucial problems created by the Bill, and every effort must be made to find a lasting solution. We need at least an assurance that any circulars issued by the Ministry on medical as distinct from administrative matters shall be advisory and never mandatory.

Secondly, there is the whole question of inspection. Inspection will be a necessary and essential function, and if it is well performed will be one of the chief means of securing all-round improvement in the hospital and other services; but the Bill is curiously silent about it. What does this silence portend? Presumably that the power of inspection is vested in "the Minister" by virtue of his assumption of responsibility for the service. The power of inspection, however, may be used to encourage or discourage particular methods not only of administration but of medical treatment, and we are bound to ask whether it is satisfactory that in a service in which medical and non-medical affairs inevitably interlock, this power should vest in the Minister unrestrained by any specific safeguards. The danger could, we believe, be reduced by following the lines of a statement issued by King Edward's Hospital Fund in 1944 and making the inspectorate of each region responsible to the regional hospital board. This would follow the pattern of the educational service, in which the larger authorities have their own inspectors. Like the Ministry of Education, the Ministry of Health would no doubt insist on having its own "national" inspectors, but their function could be made complementary to those of the regional inspectors. If inspection were undertaken mainly from the centre the Ministry would very often be tempted to short-circuit the regional boards and deal with the hospitals direct; but with a dual system of inspection it would be natural for the Ministry to communicate its observations to the board, whose hand its inspectors could usefully strengthen when necessary. Whether or not this dual system is the best possible answer, the point is one that cannot be allowed to go by default; for unless there are definite arrangements about the appointment of inspectors and the procedure they are to follow, too much direct power might fall into the hands of whatever persons were appointed on the advice of the Minister's permanent staff. Nor is this point of only academic importance. In the House of Lords on April 16 Lord DONOUGHMORE drew attention to advertisements issued recently by the Ministry of Health for permanent regional nursing officers whose duties were to include the inspection of training-schools for nurses. He asked to whom these officers were to be responsible. Were they to be part of the new regional machinery? If so, why was the Ministry proceeding with their appointment before the new bodies had been set up and had had a chance to consider the purposes for which the officers were required and the qualifications they would need? The reticence of the Bill on this fundamental subject of inspection is disturbing, and it is not too much to ask that the Minister should show his confidence in his new machinery by entrusting to it the main responsibility for inspection. The alternative—retention

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of all powers of inspection in the hands of "the Minister," as distinct from the new machinery—might well prove inconsistent with professional freedom.

It is often said that "the Minister is being made responsible to Parliament and therefore he must retain the ultimate responsibility"; but what does "the Minister" mean, and what is he "responsible" for? We are concerned here with professional responsibility and its widespread ramifications. Perhaps the familiar analogy with the legal position of hospital and doctor will help. The governing body of a voluntary hospital is (or has been) responsible for the management of the hospital. But for the medical treatment given? No: its responsibility ends with the employment of duly qualified and properly selected professional staff, and the quality of the service given is their responsibility. So now with "the Minister": his responsibility ends with the administrative side of the service, and he may rest content when he has fairly and squarely entrusted the medical and professional aspects to bodies properly constituted who must bear their own professional responsibility.

Tick Paralysis

THE list of diseases known to be associated with the tick has been increasing steadily, and now includes the typhus group of rickettsioses, a bacterial infection (tularæmia), some spirochætal relapsing fevers, and virus diseases such as Russian May-June encephalitis. Another type is possibly tick paralysis, where a toxin originating in the tick appears to be the responsible factor. Tick paralysis has gained clinical recognition through the appearance of occasional case-reports, either singly or in small series, since 1912, when TODD [1] postulated the existence of the condition after a survey among the doctors of southern British Columbia, and TEMPLE [2] gave an account of a case seen in 1898 and of two others personally observed. STANBURY and HUYCK [3] have now reviewed the published work on the subject.

The disease is most often seen in the north-western states of the U.S.A., in southern British Columbia, Saskatchewan, and Alberta, in coastal strips of eastern and western Australia, and, with less certainty, in Cape Colony, Crete, France, and Yugoslavia. The tick responsible in America is usually *Dermacentor andersoni*, and sometimes *D. variabilis*, but there are several large areas in America where *D. andersoni* abounds and yet no cases have been reported. The patient is usually a small girl who has been playing in the woods or fields, or with animals, and whose long hair conceals a tick; but adults, if bitten, are equally affected. A few days after the attachment of the tick the child complains of weakness of the legs, usually on rising in the morning, and an ascending flaccid paralysis then rapidly develops, affecting both arms and legs, sometimes with loss of sphincter control, and with variable sensory disturbances. Reflexes are diminished or absent. There may be restlessness and aching of the limbs, vertigo, photophobia, and vomiting. As a rule the temperature and pulse- and respiration-rates are not raised until the terminal stages, and a feature of the illness is the patient's comparatively normal appearance, apart from apprehension. The condition progresses steadily and quickly over a period of days. Signs of bulbar involvement, such as respiratory distress, dysphagia, and dysarthria, may develop suddenly. Death is due to respiratory paralysis, and may be preceded by convulsions. Fortunately, the effect of removing the tick, which search usually reveals on the scalp, but sometimes elsewhere, is dramatic. If bulbar signs have not developed the patient may recover completely in 48 hours. In the cases reported from Australia, due to *Ixodes holocyclus*, the illness is more acute; its height is not reached until 48 hours after the tick has been extracted, so that death may not be prevented by removal; and recovery may take weeks. A case reported by EATON [4] suggests that removal of the tick must be complete. Despite the extraction of all except the mouth parts in the pre-paralytic phase, severe paralysis developed in the succeeding 24 hours, and clinical improvement occurred only after removal of the remainder of the tick.

The mechanism of the illness is still far from clear. There are no satisfactory reports of pathological studies in humans, and information on changes in blood and cerebrospinal fluid is deficient. In the American literature STANBURY and HUYCK find only six thorough case-reports, and laboratory findings are recorded in only four. Unfortunately there is no laboratory diagnostic test to differentiate the disease from other tick-borne conditions of similar distribution in which neurological signs are found, such as Rocky Mountain spotted fever. The uncertainty of diagnosis has been a serious obstacle to the correlation of tick-borne paralysis in domestic animals with the findings in man. Paralysis in animals was recognised among the sheep farmers of Cape Colony long before it was first clearly described in 1904; it attacked individual sheep, which would be found lying helpless in the veld, between May and July. Removal of the ticks, *I. pilosus*, which were invariably present, was usually followed by recovery in a few hours. Dipping prevented the disease. Similar conditions in other animals, including dogs, cattle, and moose, have been described in both Australia and North America, and, experimentally, paralysis regularly follows the attachment of ticks in sheep and guineapigs. Despite the lack of precise pathological data, there seems no doubt of the existence of an animal disease, particularly in cattle and sheep, comparable to tick paralysis in man.

Inoculation with the blood of diseased animals, or with extracts of liver, lungs, or brain, has consistently failed to produce signs. This failure, and the course of the illness, make it seem unlikely that the disease is caused by transmission of an infective agent. It has been established that a gravid female tick is necessary for the experimental reproduction of the disease. A female tick which weighs 1 mg. on attachment increases to about 20 mg. in approximately four days, when ova begin to form; and before it falls off, fully engorged, after some ten days, it may weigh as much as 450 mg. A toxic agent, thought to be formed in the tick eggs and later diffused throughout the tick body, has been demonstrated in

1. Todd, J. L. *Canad. med. Ass. J.* 1912, **2**, 1118.
2. Temple, I. U. *Med. Sentinel*, 1912, **20**, 507.
3. Stanbury, J. B., Huyck, J. H. *Medicine*, 1945, **24**, 219.
4. Eaton, A. *Aust. med. Gaz.* 1913, **33**, 391.

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saline emulsions of tick ova from *Rhipicephalus sanguineus* and *D. reticulatus*; but it is doubtful whether this agent, though toxic to animals, is the factor responsible for paralysis in man. The salivary glands have been suggested as the source of the toxin, on the basis of hypertrophy of the alveolar cells observed during engorgement; this mechanism has not been confirmed, although it would explain (as does the ova hypothesis) the incubation-period. Attempts have also been made to demonstrate an infective agent within the tick intestine. The results of investigation into the pathological effects of the possible toxins are similarly indefinite. The most that can be said is that selective action on the anterior horn cells is a probability. TRAGER [5] has reported promising work on immunity to the attachment of ticks, and it may be that some such approach as this will ultimately lead to the laboratory diagnostic method which is clearly desirable.

Penicillin for All

ON June 1 the distribution of free penicillin through hospitals will cease, and the drug will be obtainable over the chemist's counter for any patient on a doctor's or dentist's prescription, and at a price within the range of most purses. This latest development has been made possible by the great increase in production in the past half-year, so that now the monthly output is over 250,000 mega units compared with monthly averages of 300, 3166, and 26,000 mega units in 1943, 1944, and 1945. These impressive production figures have been attained largely through deep culture of penicillium in large tanks, which has given a much increased yield of a product with a high degree of purity. Thus, while the Therapeutic Substances Regulations require a product containing not less than 300 units per mg., the penicillin now being made has a content above 1000 units per mg. The high level and reduced costs of production will allow not only prescription of the drug for any sick patient at home but also for export abroad and for extension of its use, where necessary, to veterinary practice.

It may be well, now that penicillin is being distributed more widely, to recall the limitations of this drug and the precautions advisable in its use. Issued, as it will be, for internal use as a dried powder in sealed ampoules, penicillin has to be dissolved in either sterile water or saline; in solution the substance is rather unstable and will not long retain its potency unless kept in the refrigerator. If a bactericidal level of the drug is to be maintained in the tissues, this solution has to be given by frequent injection into muscle or vein (15,000–20,000 units every 3–4 hours), and these injections must be performed with full aseptic precautions, since contamination of the solution will destroy its potency. Few practitioners would undertake such a task for patients being nursed at home, and administration of penicillin for severe systemic infections will probably continue to be a matter for the hospital or the nursing-home. An alternative procedure is to give one or two daily injections of penicillin in a beeswax-oil excipient which acts as a depot from which the drug is gradually released, but care must be taken that the excipient chosen does in fact act as a depot and does not simply postpone absorption of the drug; it is probably fair to say that this method of administration has not yet been sufficiently tested under laboratory control to justify its general use. The practitioner may therefore wistfully turn to the possibilities of oral medication; and again it seems a pity that this method, wasteful as it is, has not been given a wider trial before general release of the drug. The present position with oral therapy is that a dose equivalent to 5–8 times that required parenterally will, when given on a fasting stomach, produce bactericidal blood-levels. This method of medication, in frequent large doses, has been used successfully in the treatment of acute gonorrhœa and in pneumococcal pneumonia,[1] but more data on its efficacy in other infections are needed before so extravagant a way of using a precious drug can be recommended. For local therapy there will be the lozenge to be sucked in the treatment of mouth and throat infections, and the ointment or cream to be applied for skin lesions, infected wounds, and superficial eye infections. Penicillin is more stable in ointment and cream than in watery solution, but it does deteriorate in time and only small amounts should be prescribed. Penicillin therapy should, wherever possible, be carried out under bacteriological control, and certainly failure of a surface lesion to respond to local therapy should be an indication for bacteriological examination to find whether the infecting organism is penicillin-resistant. It may, for example, be a coliform organism, proteus, or pyocyaneus, or a penicillin-resistant staphylococcus.

The period during which treatment with penicillin has been almost confined to hospital patients under laboratory supervision has enabled clinicians to assess the uses and limitations of the drug, and the fruits of this experience have been widely published. Penicillin has the great advantage over the sulphonamides that it is almost devoid of toxicity; and it is, besides, a much more efficient local antiseptic, since it is not inactivated by purulent discharge. But it should not be substituted for the sulphonamides in infections where the latter have already proved their worth. Though penicillin will be the drug of choice for staphylococcal infections, it has no great advantage over the sulphonamides in the treatment of streptococcal and pneumococcal infections (except meningitis due to these organisms), while it is quite ineffective in coliform infections of the urinary tract and probably in abdominal infections. Sometimes it may be useful to give the two drugs together, for, in the test-tube at any rate, some synergic action has been observed. When in doubt, the practitioner should seek advice from his hospital or laboratory colleague.

5. Trager, W. *J. Parasit.* 1939, **25**, 57.

1. Finland, M., Meads, M., Ory, E. M. *J. Amer. med. Ass.* 1945, **129**, 315.

THE Royal Australasian College of Surgeons has presented £1000 towards the restoration fund of the Royal College of Surgeons of England. This sum, which was subscribed by fellows of the Australasian college resident in Australia, is additional to the amount already given by the fellows of that college in New Zealand. Surgeons in the two Dominions have now presented altogether £2300 towards the fund.

THE Lloyd Roberts lecture will this year be delivered by Field-Marshal Viscount Montgomery, whose subject will be Morale, with Particular Reference to the British Soldier. The lecture will be given at 3 P.M. on Oct. 28, at the Royal Society of Medicine. Admission will be by tickets, which will not be issued until early in October.

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Annotations

TURNING-POINT

AT a special meeting last week the Royal College of Physicians of London passed the following resolutions:

1. The college acknowledges the urgent necessity for reorganisation of the hospital service and approves the principles of the relevant proposals in the National Health Service Bill.
2. Much will depend on the regional boards and the college agrees that the appointment of their members should be determined entirely by their personal fitness for the work.
3. To foster local interest and to encourage initiative the college believes that it is essential to allow hospitals as much independence in administration as is compatible with the regional plan, and for the same reasons it considers that in the case of endowments due account should be taken of the wishes of the donors.

This meeting will, we believe, prove a turning-point. For the first time one of the principal organisations of the profession has made a public statement on the National Health Service which emphasises support rather than objections, and offers that support on means as well as ends. The Government's proposal that hospitals should pass into national ownership and be administered through regional boards is a cardinal feature of the Bill, closely affecting the work of fellows and members of the Royal College of Physicians; and it is acceptable only to those who recognise the "urgent necessity for reorganisation." In associating itself with this proposal for effective reform the college has shown both a sense of realities and a spirit of coöperation which will strengthen public confidence in the profession.

PRESSURE ON MATERNITY SERVICES

THE rise in the birth-rate is causing practical difficulties owing to the scarcity of midwives and of maternity beds in hospitals. To make the best use of both, the Minister of Health has advised local authorities to discuss the position with local voluntary hospitals and district nursing associations. There were 20,000 more births in the first quarter of 1946 than in the last quarter of 1945, and there may be as many as 40,000 more in this second quarter than there were in the first. This steep rise is expected to continue in the third quarter of the year. Mothers must therefore be encouraged to have their confinements at home unless for medical reasons they need to be delivered in hospital, or unless their homes are so unsatisfactory that confinement there is out of the question. Admission to institutional beds may have to be made according to need instead of according to order of booking. So that beds may be released as quickly as possible, the Central Midwives Board has decided to take no disciplinary action against an institutional midwife who attends a patient for only ten days after labour instead of the prescribed month. This will enable maternity units to discharge all patients who are well enough on the tenth day.

Those responsible for maternity units are urged to distribute their staff to the best advantage. Thus it may be possible to transfer patients during the puerperium to a post-delivery ward or annexe where they could be looked after by maternity or general-trained nurses. Meanwhile the midwives could concentrate on deliveries. Local authorities are asked to help domiciliary midwives who have no car by providing one from other services, perhaps engaging a driver from among women recently demobilised. Autocycles might be obtained for midwives now using pedal cycles. The Minister hopes it may be possible to hasten the rate at which cars can be provided for midwives. Housing authorities are asked to help to find accommodation for midwives; and the Post Office has undertaken to fit their telephones quickly.

Qualified midwives who are not practising are to be encouraged to return to practice or are to be released from work which is less immediately urgent. Thus health visitors and school nurses may be temporarily seconded to the midwifery service, though in some cases they will be used more freely for maternity nursing than for actual deliveries. Local supervising authorities can make an order enabling a midwife who has surrendered her certificate to resume practice, and qualified midwives who need refresher courses are entitled to Exchequer grants. Male nurses can be used to relieve women nurses for midwifery and maternity nursing.

THE POSITION OF THE BLOOD DONOR

BEFORE the late war transfusion was used on a relatively small scale, and the needs of the hospitals were met by voluntary donors, many of whom belonged to the Voluntary Blood Donors' Association. During the war big developments in transfusion treatment made it necessary to establish blood banks and to enrol very large numbers of donors. In peace-time blood and blood products will be required almost as abundantly, for it is now known that cases of many types benefit from transfusion, and many more doctors have become familiar with the technique. As the Ministry of Health and the regional transfusion officers were quick to realise, substantial donor panels will have to be maintained in the future, and the National Health Service Bill proposes that the Minister should become responsible for organising this voluntary service. The Voluntary Blood Donors' Association[1] learned this with some apprehension, feeling that its members, as public-spirited pioneers in this field, deserve to be consulted on any such service before it is finally established. It is easy to sympathise with this desire; for in the past the association has safeguarded the welfare of its members, and has helped to maintain an enthusiasm so great that some donors have upwards of 50 transfusions to their credit, and over a thousand have given blood 10 times or more. These people believe that they are in a position to give sound advice on conditions of service, investigation of complaints, and compensation in cases of mishap. They are also anxious to ensure that stored blood shall not be wasted, as happened sometimes in the early days of the banks.

Happily it is easy to reassure them on many of these points. In the new service, the regional transfusion officer will be, as he is now, a hæmatologist skilled in transfusion technique, consultant to the hospitals in his region, and responsible for maintaining their supply of blood. He will want the scheme to run smoothly, and complaints from donors should become rare as technique and efficiency improve. The taking and giving of blood is almost entirely a matter of practice, and it is proposed that every hospital should have a transfusion officer specially trained in the method; but the greater part of the supplies will be collected, as during the war, by expert staff belonging to the regional headquarters. It is true that the Ministry have published no proposals for compensating any donors who may have unfortunate experiences, but it is also a fact that during the war the few claims were quickly and sufficiently met by the Government, and it is reasonable to suppose that future claims will be considered as sympathetically. Waste of stored blood is wholly avoidable. Time-expired blood can always be converted into dried plasma, and a weekly turnover of the blood-bank stock is easily arranged, ensuring that a supply of fresh blood is always obtainable and that unused blood is converted to plasma within 8 or 10 days of being drawn.

Members of the V.B.D.A. have set much store in the past on a report on each case telling the donor what

1. Memorandum on the National Health Service, April 22, 1946. Published by the V.B.D.A., 216 Bishopsgate, London, E.C.2.

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effect his gift of blood had on the patient who received it. These reports, with their strong personal interest, naturally did much to maintain the keenness of donors. Unfortunately this gracious custom could not well be continued under the new conditions. Blood is now given for many disorders that show little immediate response, and perhaps none at all to a single transfusion. A patient with severe anæmia, for example, may need 20 or 30 transfusions before showing substantial improvement. Donors nowadays must be content to add their blood to the common store, and to know that they are doing good anonymously and as one of a group. That many find this a sufficient reward has been shown by the ready response to appeals for donors during the war. Since very large numbers will be needed it will no longer be possible to rely on a small staunch body of veterans; these must be honoured as the pathfinders, but must now consent to share their responsibility with the new entry, to whom they have shown the way.

OSTEOMYELITIS OF THE SPINE

PYOGENIC osteomyelitis of the spine often presents a baffling problem in differential diagnosis; its manifestations may be deceptively mild or they may be referred to remote parts of the body. Guri,[1] who has investigated the problems of localisation and diagnosis of the infective process, points out that this may present as several different syndromes. There may be acute pain around the hip-joint with flexion spasm and fever, simulating a suppurative or tuberculous arthritis; but movements other than extension are not restricted, and local spinal tenderness and spasm can be elicited if sought for. The abdominal syndrome, with pain, hyperæsthesia, and leucocytosis, may mimic appendicitis, and appendicectomy has been performed. Another group of cases is marked by meningeal irritation, with malaise, headache, and meningism, very much as in an acute or tuberculous meningitis; since the cerebrospinal fluid may exhibit a reactive pleocytosis, the final diagnosis rests on the often delayed appearance of radiographic foci. Most cases do present with back pain, though in less than half is it really acute, with severe tenderness and spasm, fever, and toxæmia. It must be remembered that the condition is sometimes complicated by an epidural abscess; when this develops slowly after a mild onset and causes paraplegia it may be mistaken for a neoplasm of the cord.

When osteomyelitis is insidious in onset, as it often is, diagnosis from other conditions such as typhoid and pneumococcal spondylitis, or brucellosis, is usually settled by the history and by agglutination and skin tests; but the differentiation from tubercle may be extraordinarily difficult. If the lesion is localised in the neural arches it is practically always of pyogenic origin; tubercle in this site is rare. Apart from culture of pus from the abscesses—which resemble cold abscesses—or the discovery of osteomyelitic foci elsewhere in the skeleton, diagnosis usually depends on serial radiography. The X-ray appearances are various. There may be a localised focus in a vertebral body or the process may be closely related to an intervertebral disk. Indeed, it has been suggested[2] that some cases are primary infections of the disk with narrowing and collapse; and there are numerous reports[3,4] of disk degeneration and low-grade regional osteomyelitis of the spine following lumbar puncture. In other cases the front and sides of the vertebral body or the epiphyseal ring are involved.

Neither the shape of the lesion nor its localisation, but only its radiographic evolution over a considerable time, establishes it as non-tuberculous. Pyogenic spondylitis is often a diffuse process without localisation, leading to a dense reactive sclerosis which bridges the vertebral bodies. Of course such sclerosis is rarely observed in tuberculosis; but it is of interest that radiography of postmortem specimens in Pott's disease does often reveal patchy sclerosis and sequestration which cannot be observed in the living.

1. Guri, J. P. *J. Bone Jt Surg.* 1946, **28**, 29.
2. Ghormley, R. K., Bickel, W. H., Dickson, D. D. *Sth. med. J.* 1940, **33**, 347.
3. Everett, A. D. *Proc. R. Soc. Med.* 1941, **35**, 208.
4. Epps, P. G. *Ibid*, 1941, **35**, 220.

THE ANÆSTHESIA FILMS

THE series of films on the technique of anæsthesia, made for Imperial Chemical Industries Ltd., is now complete. The eleven films, representing a total running time of six hours and made at a cost of perhaps £15,000, cover the practical aspects of the administration of inhalation, intravenous, and spinal anæsthetics and the attendant dangers. The series marks an epoch in the history of the teaching film, for it was conceived, planned, and executed as an interrelated group; the titles of all eleven films were announced before the first was completed, and all eleven have been delivered. It is true that this is not the first series of films to be made—for instance, the Dons, father and son, of Ashford, have made nearly as large a series of short films, but their films were made ad hoc as each subject presented itself, and the only connecting link between them is the source of origin. Again, the late Prof. Joseph DeLee produced a series called "The Science and Art of Obstetrics," but although they had more coherence they too were each made as opportunity arose and the series was capable of being added to. By designing each film as part of a preplanned series, like the chapters of a book, I.C.I. have prepared a comprehensive sequence of demonstrations, each lasting 20–30 minutes, each complete in itself, yet not repeating the content of any other. Isolated teaching films have been made at comparable cost by professional film units, but this is the first series of teaching films made without any attempt to recoup the expense directly or indirectly, either by sale of the films or by inserting an advertising message. Thus at last the old and vicious circle of no films—no projector—no films has been broken; every progressive medical school will demand projectors for this series, and the gateway will then be open for more teaching films to be produced in the knowledge that projectors will be available to show them if they are of sufficient merit. This immediately raises important questions: should the sponsorship of these future films be left to philanthropy, taken over by public enterprise, or encouraged by coöperation between the medical schools? Films of this kind are so costly that, with their specialised appeal, they will be an economic proposition only if they can be exchanged on some basis which is independent of international boundaries.

The eleven films are highly dogmatic; they present only one school of teaching and make no mention of the possibility of alternative methods. This is probably a wise decision; books can be read and re-read and a nice balance of opinion sifted and assessed; but the film travels inexorably on, and two solutions offered to one problem leave the student uncertain of either. They are packed solid with information; all will yield further instruction at a second viewing, and many need to be seen three or more times to get their full teaching value. The film is often extolled because it can present in 10 minutes material that takes 40 minutes to say; but if it has to be seen four times to yield its full content what is the advantage? A book based on these films and illustrated by shots from them is badly needed; the book could then be read chapter by chapter before and again after the film is screened; and the book could also discuss the alternative techniques that are not mentioned in the films. The place of film-strip supplements must also be considered. The film unit responsible for

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the production of the series have done an excellent job. The student watching the films will not realise the amount of work entailed, the problems overcome, or the degree of coördination achieved between medical and film experts. Many of the film technicians appear as a patient in one or other of the films, and the anæsthesia was not often faked; some of the shots are monuments to the patience of the documentary unit, and many of them are on a high artistic level. The series has set a standard for the films which will follow.

NEW ELEMENTS FOR OLD

Prof. N. Feather, F.R.S., lecturing on May 7 in a series organised by the Edinburgh Postgraduate Board for Medicine, described the principles governing the transformation of one element into another by atomic nuclear disintegration. Study of elements which undergo spontaneous changes of this nature has shown that radioactivity is derived from the emission of particles from the atom nucleus. The chemical properties of an element, on the other hand, are related to the behaviour of the outermost electrons; but a change in the nucleus, by altering the balance of electrical charges, will change the number of outer electrons and thus produce different chemical properties. Very active measures are needed to produce artificial changes in the nucleus, which is extremely small and difficult to hit. The first successful attempt was made by Rutherford in 1919, when a few atoms of nitrogen were changed to oxygen; but no new stable elements were made, and four atomic numbers in the periodic table remained unassigned, until the neutron was discovered in 1932. The neutron, which has the same mass as a hydrogen atom, has no charge and no chemical properties, and can be used to bombard an atomic nucleus with greater effect than positively charged alpha particles. In 1934 the Joliots produced atomic nuclei not formerly present on the earth. These substances are radioactive isotopes of the common elements, and soon change to more stable atoms. Nearly 400 of these isotopes, covering the whole periodic table, are now known; most of them have been discovered by using slow-moving neutrons, which convert the isotope of an element into the next higher isotope; this may be either naturally occurring and stable, or artificial, unstable, and radioactive. There are now many substitutes for radium, but they are often so highly radioactive and short-lived that their practical uses may be limited. Radioactive isotopes, and particularly the fragments of uranium nuclear fission, may be of value in the study of biological processes. The body is unable to distinguish these artificial elements from naturally occurring elements, and receives them into the normal processes of metabolism. Their subsequent fate can be studied by their distinctive radioactive "labels"; and they soon revert to innocuous and stable elements which are dealt with by normal physiological means.

NEURAL FIBROBLASTS IN NERVE REGENERATION

IN a recent paper[1] Denny-Brown proposes a fundamental change in our ideas about nerve regeneration. Since the work of Nageotte it has been widely accepted that the union of severed nerve stumps is effected largely by means of Schwann cells migrating from the peripheral cut end. Denny-Brown now seeks to show that (1) these migrating cells are not Schwann cells, and (2) they are a special type of neural fibroblast. His evidence for the first thesis is that the cells do not stain with Peer's modification of Mallory's stain, which is specific for Schwann cell nuclei. Unfortunately however these cells are very variable, and one feels doubtful whether a dye which stains them in their normal condition will necessarily do so after the profound modifications which they undergo during degeneration. The paper does not provide satisfactory evidence on this point.

It is always difficult to identify nuclei with certainty by staining criteria, and until the specificity of the stain is satisfactorily demonstrated it would be unwise to accept the view that these are not Schwann cells. The evidence that they are modified fibroblasts is also inconclusive. It depends on tracing a continuity between the outgrowing columns of cells and certain fibroblasts in the peripheral stump—a region occupied by cells of so many types that the difficulty of identification is agreed by all. A special complication is that the nerves used were not severed by clean cuts but by a method of withdrawal from the epineurium which must have produced considerable damage to the ends.

The question of the origin and classification of the sheath cells of nerve is by no means settled, and further investigation is necessary if serious confusion is to be avoided. Previous investigations have shown that nerves contain a special type of cell which migrates in columns from a severed peripheral stump, thus behaving quite differently from fibroblasts, which are also present in great numbers. Denny-Brown seems to minimise this difference between the two types of cell, and indeed there is some doubt whether in his experiments he has seen the columns of cells usually called Schwann cells. These columns are certainly present, and the current opinion that they are Schwann cells and play an important part in regeneration should not be lightly set aside.

Denny-Brown's point of view is clearly influenced by his interesting discovery that it is possible to make a tube of perineurium by removing the whole contents of the nerve, since the lamellæ of perineurium consist of sheets like mesothelium which allow sliding. He found that regeneration was as effective through such tubes as through nerve grafts, and suggests the possibility of their clinical use for bridging defects in peripheral nerves. Whether this will prove practicable depends on the discovery of human nerves that form suitable perineural tubes.

1. Denny-Brown, D. *Arch. Neurol. Psychiat.* 1946, **55**, 171.

B.C.G. IN DENMARK

IN Denmark, as in other Scandinavian countries,[1] much attention has been paid to the potentialities of B.C.G. vaccination. A full-scale investigation was impossible in the war years owing to the German occupation and the more urgent need for immunisation against diphtheria. It was also thought that further knowledge of B.C.G. vaccination should be obtained before it was advocated for general use. But these considerations did not prevent the systematic B.C.G. vaccination of all Mantoux-negative members of hospital staffs.[2] During the summer of 1943 X-ray surveys were made of several Danish towns, in some of which B.C.G. vaccination of all tuberculin-negative persons had already been undertaken. In this way material, including controls, was provided. In November, 1944, the Danish National Tuberculosis Association suggested to the ministry of health an extension of B.C.G. vaccination, particularly for those between the ages of 15 and 25. A report issued in February, 1945, shows that B.C.G. vaccination increased to such an extent between 1940 and 1945 that there is now a prospect of all school-children between the ages of 10 and 14 being vaccinated during the next two years. A standing committee has been appointed to deal with the further development of this measure, and it is noteworthy that its six members include a representative of the Danish general practitioners.

Dr. Edith Summerskill, parliamentary secretary of the Ministry of Food, is leading the British delegation to the Food and Agriculture Organisation meeting in Washington this week.

1. *Lancet*, April 6, 1946, p. 507.
2. Gravesen, J. *Nord. Med.* April 12, 1946, p. 803.

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Special Articles

UNRRA'S HEALTH CAMPAIGN IN GREECE

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WE in UNRRA work under an agreement with the Greeks whereby they are the controllers of their own destinies, and we are there simply to advise, encourage, and help.

In the field of health, the knowledge and experience of new methods which we gained while the Greeks were cut off from the rest of the world by occupation, enables us to give them constructive advice on rehabilitating their medical and nursing services, preventive medicine, and control of malaria. This side of the work is quite as important and far-reaching as the re-equipment of hospitals and importation of drugs, which is the more immediate. The country was left physically sick, and it is impossible that a nation in that state can do much about restoring itself until it has reached relative health. UNRRA's first move here was, therefore, to set up an organisation parallel to, and working in closest coöperation with, the Greek public-health service, whose aim is the prevention of disease on a national basis. Almost simultaneously came the organisation of a service, again parallel with that of the Greeks, for the treatment of certain diseases, such as tuberculosis and malaria, which again are attacked on a national basis.

Great quantities of medical stores had to be imported to put these major policies into effect. A medical-supplies section was a fundamental factor in the UNRRA medical rehabilitation programme. The Greeks manufacture very little, and they had been thoroughly pillaged. During the war they received only what the Germans allowed them, plus minimum supplies from the Red Cross. Without these their state would have become hopeless.

Though Greece produces enough doctors, even when the equipment of their medical schools is almost entirely lacking or in disrepair (the enemy did not usually leave scientific apparatus of value behind him), the situation in regard to nurses and nursing schools was deplorable. Therefore a powerful nursing training section came into being, with results which are already beginning to show themselves. Clinical pathology, hospital and public-health laboratories, the indispensable handmaids of any modern medical service, had almost ceased to exist, and UNRRA is steadily training local technicians and re-establishing laboratories throughout the land.

TUBERCULOSIS

Tuberculosis is the greatest menace to Greek health. Before the war the Greeks had made serious and important efforts in both prevention and treatment. During the occupation not only did the disease spread rapidly because of malnutrition and lack of shelter, but also the really modern sanatoria which had been set up were taken over by the Germans and used for troops, with the result that no serious attempt could be made to treat sick people, let alone check the spread of the disease. UNRRA brought in a corps of tuberculosis specialists, who have made a survey, the results of which are alarming. The incidence of tuberculosis is at least sixteen times greater than in the United States or Great Britain; 20,000 sanatoria beds are required, but only just over 4000 are available, and these often in institutions whose equipment has been wrecked and whose means are scanty.

Immediate measures were taken by the importation of more specialists and the formation of five tuberculosis teams, each consisting of a doctor and nurses, trained in the treatment and prevention of the disease, a radiologist, and a clerk. These teams have been placed in strategic positions throughout Greece, and travel from town to town and village to village in their area. At first they visited sanatoria and surveyed prospects for their re-establishment or the establishment of new ones. Later they helped the local authorities to set up tuberculosis dispensaries for diagnostic purposes. They trained their Greek colleagues in the use of radiographic units, particularly mass radiography.

Although this work for the conquest of the disease has only just begun, certain specific results have already been achieved. Dispensaries have been set up throughout the country, which means that tuberculosis will be diagnosed in many thousands of people at an earlier stage, and often arrested. Mass radiography not only achieves this result but also helps to make contact between the general public and the people who are working on tuberculosis, so that health education and advice on the prevention of the disease may be begun.

A direct result of UNRRA's work in this field during the past few months—it is not yet a year—has been the establishment of a national tuberculosis council. This council, which works on a purely voluntary basis, corresponds to the National Association for the Prevention of Tuberculosis. Although it is a purely advisory body, it is composed of Greek experts whose decisions will influence the government's policy in this fight.

But, in the absence of a specific cure, tuberculosis cannot be conquered in weeks or months, and it is necessary to think in terms of years. If this splendid beginning is to be maintained, help will have to be forthcoming for a long time. Failing that, there will probably be a falling away when UNRRA leaves (foreshadowed for the end of 1946), and the agony of the Greeks in this regard will be renewed. The prevention and treatment of tuberculosis on the scale required here is simply beyond the resources of this relatively poor country, even under the best peace-time conditions of national economy, and for many years outside help regularly, not spasmodically, supplied will be essential.

MALARIA

Perhaps the most dramatic project in hand at the moment is the nation-wide offensive on the age-old scourge of Greece, malaria. Some 87% of Greece is malarious. Over a million cases a year (in a population of only 7 million), with 5000 deaths, was the average before the war. By 1940 the Greek government's malaria service, thanks largely to the Rockefeller Foundation, had 200 malaria-control stations; but the war broke up this organisation, and in 1942 the number of cases had risen to 3 million. In view not only of the death-rate but also of the energy-sapping power of this disease, the war on malaria became a first priority in UNRRA's plans for the rehabilitation of Greece.

The attack has been in two waves, the first during the late winter by hand-spraying with vaporised D.D.T. solution houses and outbuildings in which the hibernating adult mosquito congregates. The second in the spring and early summer by hand-spraying of water accumulations to kill the larvæ, again using D.D.T. but in oily solution. At the same time twelve UNRRA aircraft with Greek pilots, trained by veterans of the Tennessee Valley project, have commenced to spray the great marshes. Each aircraft will do the work of 6000 men. Where aircraft cannot penetrate, 250 bicycles, 100 motor-cycles with side-cars, 40 light trucks, and 40 jeeps and tractors will press the attack. The 1946 figures for malaria in Greece should be the lowest in history; in two years malaria may be reduced to almost negligible proportions.

SANITATION

The UNRRA sanitary engineers have also assisted in improving the water-supplies in small centres of population. The usual wells are habitually unsafe, and typhoid fever is endemic in Greece. New wells have been sunk and old ones put into a good state of repair, with the

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result that a decrease in the mortality from waterborne diseases is certain.

The sanitary engineers of UNRRA are the only truly operative section. Besides planning and advising, they actually do the job, with the assistance of Greek engineers and technicians, hiring labour and expending UNRRA funds. The UNRRA principle is, however, not lost sight of; and they are constantly training their opposite numbers, so that when UNRRA leaves there will be well-trained and efficient Greek technicians to take over.

ORTHOPÆDIC TREATMENT AND REHABILITATION

A most distressing feature among the men of military age in Greece is the high proportion of crippled and mutilated. This is a result of the hardships of the Albanian campaign in 1940–41. In addition to the difficulties of transport of the wounded in the rugged and undeveloped mountain areas, hospital facilities were poor, and during the bitter winter frostbite took its toll of arms and legs. UNRRA has come to grips with this problem, and with great aid from other foreign agencies has got on well with improving workshops for artificial limbs, with projects for orthopædic hospitals, and with occupational therapy. A distinguished American orthopædic surgeon has joined UNRRA, and is working in Greece now, and the standard of this department of surgery should soon be raised to the most modern level. Further, the Greek government have agreed that institutions providing orthopædic treatment and rehabilitation for the armed forces shall accept civilians in increasing numbers.

Nor have the blind and deaf been forgotten in rehabilitation schemes. Special workers in these two fields have been in Greece with UNRRA on surveys and are returning for active work. Greece has an infliction of national importance in trachoma, which in certain islands has an incidence of 10% of the children. There is no specific cure; treatment is long and painful, with results which cannot always be called satisfactory. The Greeks have always had special clinics for trachoma, and we help them with supplies. As the disease always impairs vision and frequently goes on to blindness, preventive measures are of the first importance. Here the constant teaching of simple measures of hygiene has an important part to play, and this is just a fraction of the uphill task UNRRA nurses are called upon to undertake.

The restoration of hospitals and public medical organisations is well under way. Provision through UNRRA of supplies to allow the reopening and efficient working of the many private clinics destroyed or damaged and pillaged, and even the furnishing of professional equipment to private doctors who have lost it through enemy action, is being undertaken by the Greek government with UNRRA aid. We have our experts here who collaborate with the ministry of hygiene officials and such bodies as the Pan-Hellenic Medical Association.

The care of infants and mothers is undertaken by a semi-governmental organisation known as PIPKA or the Patriotic Foundation; this is also responsible in large part for the special feeding of infants, school-children, and expectant and nursing mothers. UNRRA provides a corps of expert nutritionists, who plan and supervise, making everywhere the most of food-supplies which come to hand. Further, a special maternity and child-welfare section is to be set up within the health division and will shortly start to function.

DISTRIBUTION

It is sometimes forgotten, even in Greece, that the system of supply, both medical and general, is, that all items become the property of the Greek government immediately on landing there. Distribution is primarily carried out by the Greek government agencies. This system has many drawbacks, but it is the only one practicable. UNRRA, however, by agreement with the Greek government, takes a close interest in every step of warehousing and distribution of stores, and has its own officials on every government committee concerned. This applies also to the committees in subdivisions of regions; thus an effort is made to ensure that all supplies reach those for whom they are intended. Broadly speaking, the vast majority of the population receive medicines and medical stores for an insignificant token payment, which barely covers the costs of distribution through Greek channels. A small proportion of stocks is being diverted through the pharmacists, at rates agreed by the government, and sold at controlled prices. Hospitals and dispensaries receive their stores gratis, while private establishments and doctors will pay cost price plus an agreed amount again determined by the government.

ACHIEVEMENTS AND PROSPECTS

This, therefore, is a somewhat sketchy outline of the work being done by the health division of the UNRRA mission to Greece. The medical rehabilitation of the country is in full swing. The Greeks are being brought into line with non-occupied countries. The work is not as fast as we would like, owing to the multitudinous difficulties with which we must contend. Political divisions (and every Greek is by nature deeply political), the calamitous inflation of their currency, labour unrest with frequent strikes, overcentralisation of government, a traditionally overpopulated civil service, a certain inertia natural enough as a result of their war sufferings, all these and more bring about delays and frustrations which require endless tolerance and patience to grapple with. But the work goes on. This unit of UNRRA is steadily showing that, given a job and the tools, no obstacles are too great for it to surmount.

It is doing something else. It is breaking down that spirit of exclusive nationalism which lies at the root of most of the world's troubles. I speak only for my own division, where it is difficult to believe, and is indeed almost completely forgotten, that the members are from different countries. But I have also seen this spirit operating elsewhere in UNRRA and in sections where ignorance of each other's language might have seemed an insurmountable barrier.

A sizable volume could easily be constructed on UNRRA's medical work in Greece. What do we expect from it all?

We expect that, in the fullness of time and given adequate support, Greece will become a healthy nation, on a level with others more fortunate. We are giving Greece the most efficient and modern health knowledge and technique. Some of these projects may in the end be too costly for Greece to maintain up to the almost ideal standards we are setting, but they will have such standards always before them. When a project is launched, we are there to see that it is guided properly and that it has a fair chance, and our aim is to leave behind us our Greek counterparts, who are now training alongside us.

In detail we expect a fall in the general death-rate, a fall in the infant death-rate—it is now about three times that in the U.S. and U.K.—a fall in the incidence and death-rates from tuberculosis, a fall in the incidence and death-rates from infectious diseases, especially typhoid fever, and the almost complete disappearance of malaria. We expect to leave behind us a population beginning to take an interest in health problems, conscious of its deficiencies in hygiene, and with a notion that the health of an individual has some relation to the health of a community. We expect to leave behind us a medical profession stimulated to higher ideals from its intimate contact with doctors from the rest of the world, and a nursing profession adequate for the needs of Greece, thoroughly trained up to the best world standards and with a professional position such as it has never had before. We expect to leave behind us the

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spirit of collaboration which we enjoy with the great foreign agencies, the Greek War Relief Association of U.S.A., the Near East Foundation, the Red Cross associations of Switzerland, Britain, South Africa, and Australia, the Order of St. John, the Palestinian Relief Organisation, the Society of Friends, the Save the Children Fund of Britain, the British Council, and the internal Greek organisations, such as the ministry of hygiene, the Greek Red Cross, and the Greek Patriotic Foundation, all of which work with us in more or less close association in the common aim.

We, all of us, consider this job to be well worth the doing. We are on the spot and we should know. We hope the rest of the world will feel the same.

MEDICAL SERVICE IN AUSTRALIA

FROM OUR AUSTRALIAN CORRESPONDENT

THE Commonwealth government is making another attempt to provide a "free" medical service in Australia. A proposal by the minister for health for the Commonwealth (Senator Fraser) was discussed at a conference of Commonwealth and State health ministers which was held at Canberra on May 6. It was decided to appoint a Commonwealth committee and one in each State to report on the practical aspects of a national medical service based on the following principles:

1. Every person in Australia shall be entitled to medical attention without regard to his economic status and without any direct charge for the service.
2. This service shall incorporate a full range of medical attention, including all modern diagnostic and specialist services.
3. All necessary medical centres shall be established and maintained by the Commonwealth, but existing hospitals shall be used wherever possible. The Commonwealth will accept the financial responsibility for the medical staff. The committee shall, if it considers it necessary, recommend that the States act on behalf of the Commonwealth.
4. The Commonwealth, under full powers, will pass the necessary legislation.

The Commonwealth committee will comprise three Commonwealth representatives and nominees of each State. The State committees will comprise a Commonwealth representative, the chief State health officer, a representative of the State government, and—if the association will coöperate—a representative of the British Medical Association. The State committees will recommend to Commonwealth and State health ministers the location and type of centres, the specialists required for each centre, the localities in which flying-doctor services and mobile units are desirable, the nature of existing and desirable pathological, radiological, and specialist services in each country town, and localities in which one-man medical practices should be established.

Medical centres would be built by the Commonwealth in metropolitan areas and country towns. Some medical centres would be associated with hospitals.

The ultimate objective of the scheme would be the establishment of a complete medical service available free to every person in Australia. Senator Fraser said that the Commonwealth government was most anxious to have the coöperation of the B.M.A. in carrying out this service. Any proposals by the medical profession to facilitate the introduction of the scheme or to improve it would be carefully examined.

The statement that the Commonwealth, under full powers, would pass the necessary legislation raises an important question. The only powers which the Commonwealth possesses by its constitution in the field of health are under section 51 (IX), which deals with quarantine. It was largely for this reason that the High Court of Australia upset the Pharmaceutical Benefits Bill on Nov. 15, 1945. A Commonwealth referendum held on Aug. 19, 1944, asking for increased constitutional powers was defeated. The constitutional power in the field of health is held by the Australian States. It is for this reason that their coöperation in the proposed scheme has been sought by the Commonwealth.

OPERATION OF HOSPITALS BENEFITS ACT

The Commonwealth has already succeeded in providing the cost of treatment up to 6*s*. per day at all public hospitals, under its general constitutional power to make grants to the States. One of the tags attached to these grants is that hospitals accepting the benefit must abolish the means test for patients in public wards. This proviso has struck at the heart of the honorary system in public hospitals. The profession in the various States has not reacted uniformly to the abolition of the means test. The governments of Victoria and New South Wales tried to hold out against the operation of the Hospitals Benefits Act, but it would have been politically suicidal for one or two States to refuse a grant collected by general taxation from every State in the Commonwealth.

Actually, the public hospitals do not benefit financially from the Hospitals Benefits Act. The average hospital fee collected in Australia from patients was 5*s*. 10*d*. a day. This was the basis for the 6*s*. per day granted by the Commonwealth government. All that happens now is that the public hospital collects 6*s*. a day from the Commonwealth treasury instead of an average of 5*s*. 10*d*. from the patient. Those private hospitals that are approved under the Act deduct 6*s*. per day from the patient's account, and after filling in numerous forms and certificates wait two months for the Commonwealth to pay. The extra office work which this entails is just another burden hindering private hospital development and contributing to the Australia-wide shortage of private hospital beds.

ACCORDING TO PLAN

This new action by the Commonwealth government is another step in the development of the plan for the Australian Medical Service, prepared and published three years ago by the National Health and Medical Research Council of Australia. The essentials of the plan are these. (1) The salaried practitioner operating a one-man practice in a small town would be a junior, who would serve for a short period and then be transferred to a larger medical organisation. This is already being done in some remote areas. (2) That part of the plan affecting the base hospital has already been implemented in the Hospitals Benefits Act. (3) Diagnostic and health centres in suburbs of large cities staffed by general practitioners and specialists will provide both preventive and curative medical services. These may ultimately be the centre of domiciliary practice. (4) Large metropolitan hospitals, which have already come under the control of the Commonwealth through the Hospitals Benefits Act.

It will be seen then that this proposal would provide the diagnostic centres and otherwise further the plan. It is of interest that the State government in Victoria last year reopened the old Melbourne Hospital as a central hospital with a salaried medical staff. There being no means test, there is no honorary-service problem. This is the first State hospital of its kind in Australia, and it establishes a definite precedent which will be a pattern for future hospital organisation. In Queensland the honorary system was abolished several years ago by the action of the State government in appointing full-time and part-time medical officers in hospitals. All medical treatment in public hospitals in Queensland has been free since Jan. 1 this year.

ANOTHER REFERENDUM

The Commonwealth government intends, when the federal elections are held in August, to again seek the approval of the Australian people for increased powers. At the last referendum in August, 1944, so many extra powers were sought in so many fields that the people tended to be frightened. The referendum was framed on the all-or-none principle, and there was no opportunity for discrimination between desirable powers and others. There is a general feeling that if the forthcoming referendum is limited to specific fields of power, there is a good chance of its being accepted by the people.

It is expected that a request for power to pay sickness and unemployment benefits and pensions will be bracketed with the free medical and dental service. The cost of all the existing and proposed Commonwealth social services is expected to exceed £100 million per annum, or £14 per head of population. Invalid and old-age pensions and child endowment will cost £37 million; and repatriation will cost £20 million. Twelve years ago the total budget of the Commonwealth was £71 million, and in 1939, when some war expenditure was met, it was £100 million.

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In England Now

A Running Commentary by Peripatetic Correspondents

THE more anatomy of the C.N.S. I mug up for this D.P.M., the more I realise what a higgledy-piggledy muddle it is. So I have decided to Nationalise it and put it into some sort of order. The pendulum has swung too far from the simplicity of the amœba. My plan is a crusade against the present overlapping, redundancy, and distortion. It is represented (diagrammatically) in fig. 1.

The cerebrum I have retained in its essentials. The only external modification is a dotted line at the optimum site for leucotomy. But away with the basal nuclei and the Id that lurks therein. This, of course, simplifies psychopathology as well as anatomy. You will note that the special senses will use the *nearest* bit of cortex, thus saving myelin on tracts, radiations, &c., and incidentally giving more space to new cortical areas for spiritualism, transcendental mysticism, and extrasensory perception. I have arranged for the lenticulostriate artery to run through the uncus. The symptomatology of cerebral hæmorrhage will accordingly be reduced to headache and anosmia.

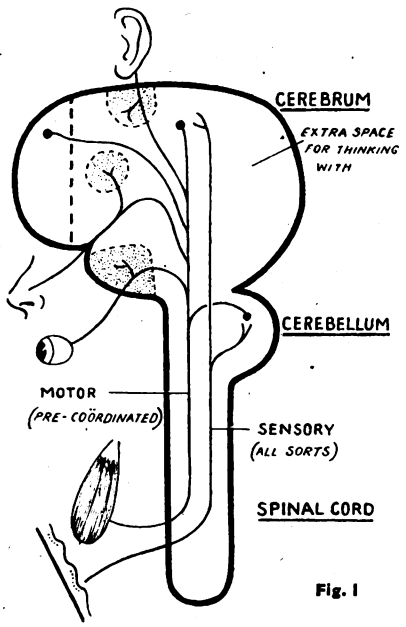

Fig. 1

I was never impressed by that blurb about the cranial nerves being fundamentally rather similar to the spinal ones. I shall not be satisfied until they are divested of their peculiarities and idiosyncrasies and made *identical* with the spinal nerves. In fact, we shall dispense with the medulla and continue the spinal cord up to the cerebrum, slightly expanding it, of course, to give the extra cells room to waggle their dendrites. I have no sympathy with this decussation nonsense—nor for migrated cell masses: these are just as dangerous and unnecessary as were the Sudeten Germans. There shall be no grey matter in the spinal cord. The timely invention of my double-length no-synapse axon will dispense with that. Simple reflexes will just have to travel up to the brain and back. Nor need Sherrington turn pale at this, for our reaction times will be halved, not doubled. One synapse in the brain is worth two in the cord. As can be seen in fig. 2, there are only two sets of fibres in the spinal cord—them as is going up and them as is coming down. Cerebellar fibres just mingle chummily with the cerebral as they pass, without any of the obscurity and wastefulness of the rubral and tectal middle-man business.

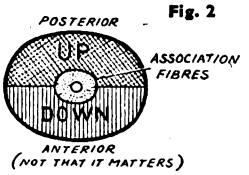

Fig. 2

I concede that this will require a lot of legislation. I expect opposition at first. It will be just my luck to get a reactionary examiner in October. But I shall point out that, even if the existing C.N.S. was good enough for his grandfather, it will not be good enough for my grandchildren.

* * *

This ship is about 6000 tons, and all the ship's officers are accommodated in tolerably clean and comfortable quarters around or above the little saloon. But the unfortunate doctor is on the main alleyway by the engine and immediately abaft of the coal intake. My cabin is dark, dirty, and ill-ventilated. The alleyway outside is usually full of deep pools of coal-dusty water, and the Asiatics—and others—spit everywhere. In tropical ports it is awful, as one must keep the portholes closed against thieves; and it is worse still when coaling.

When I first arrived the drawers wouldn't open, the steam radiator leaked, and everything was wrong, for they had had no doctor for some years. As I had already signed on I could not walk off, but I seriously debated leaping dramatically into the dock, and giving the impression that I was not quite right in the head. However, I decided otherwise. At any rate the food, though simple, is excellent and abundant, and there is ample drink. We dine at 6 P.M.

The dispensary is a hot little cupboard with no water laid on, and the medicines are all hidden by wooden partitions, so that the labels are invisible. I treat nobody inside. They have to stand in the alleyway or sit on the grubby hatch-cover just abaft the funnel.

We also have to do all our own washing: there is no space for exercise; and nowhere to sit, except the little saloon where we eat.

Ah well, at least we see the world.

* * *

The National Health Service Bill has now been committed to a Select Committee of the House, which meets on Tuesday, Wednesday, and Thursday mornings. Its deliberations are public, and any citizen can get a seat in the committee-room provided that the limited accommodation has not already been filled by earlier birds. So one fine morning as Big Ben struck ten we presented ourselves at St. Stephens and announced to the police officer on duty our firm intention of attending that morning's session of the committee. We were passed from officer to officer until at last we found ourselves installed behind the bar at the far end of a long room upstairs.

Untutored in Parliamentary procedure we had expected to see considerably less formality and a greater degree of freedom in the proceedings of the committee than would be found in the House itself. But as the Members assembled and took their places it was soon obvious that they retained "upstairs" the same pattern and almost the same modus operandi that prevails below. Government supporters filled the benches on one side of the committee and were faced by a proportionate number of the Opposition on the benches opposite. Ministers and Opposition leaders occupied the front benches, and back-benchers took up their appropriate lowlier stations. The Speaker's place was filled by a Chairman of Committee and everything took its formalised course.

Although this is the only stage at which detailed consideration can be given to each clause of the Bill, no attempt is made to debate the need for, nor the justice of, each of the several clauses as they arise, but attention is focused only on suggested amendments of these clauses of which earlier notice has been given. Some even of these amendments need not be called if in the chairman's discretion they are not sufficiently pertinent. It is obvious that a Government, whatever its nature, is likely to write into a Bill the things that will satisfy its supporters rather than its opponents, so we had been prepared to find that most of the amendments debated would be sponsored by Opposition members. What came more unexpectedly was the comparatively complete silence of the members of the committee on the Government benches, who seemed quite content that criticisms and counter-suggestions made by Opposition speakers should all be handled by the Minister himself, and who found little or no constructive criticism to offer themselves.

It may be that in these days of crowded legislation it has become part of Parliamentary practice to avoid delay by leaving all these replies to a single authoritative spokesman, or it may be that on that particular morning no matter arose on which Government supporters felt sufficiently strongly to intervene; but whatever the cause we came away with the impression that law-making can become a very dull business for a Government M.P. if all he is called on to do is to sit there day after day and answer "Aye" or "No" at the appropriate moments.

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Parliament

ON THE FLOOR OF THE HOUSE

AN unexpected feature in the work of the House of Commons has shown itself in recent weeks. The Opposition, whose duty and function it is to oppose and criticise, has not been doing its job. Opposition to the Coal Nationalisation Bill was prolonged and debated with skill, but it was not very effective. Opposition to the Budget has been feeble, and the gibe of an Opposition front-bencher that Mr. Dalton is known in the City as the "Casino Chancellor" only stirred a ripple of laughter. The opposition to the National Health Service Bill has been definitely weak, for many Conservatives do not in fact oppose it and some have actively supported it.

Opposition in the British Parliament is of course part of the constitution and the Leader of the Opposition receives a salary. But while Opposition and Government do "oppose" each other in a real as well as a technical sense the Opposition in the British Parliament is invariably coöperative. Denunciation of opponents is not so vividly phrased as in the early days of the 20th century when differences were in fact much less than they are now; though sometimes it almost seems, as on the National Health Service Bill, that Government and Opposition are growing together and their differences narrowing.

The visit of Mr. Morrison and others to Washington is helping in the solution of the world food crisis, but more important for the future is the conference of the Food and Agriculture Organisation which opened in Washington on May 20, where the staff plan for world food production will be discussed by representatives of the United Nations. If a world plan of food production can be agreed and price machinery created—perhaps by incorporating the Combined Food Boards in Washington—we shall have achieved a major victory over the present distress.

MEDICUS, M.P.

IN COMMITTEE

On May 14 the standing committee of the House of Commons which is to consider the National Health Service Bill met for the first time. Its members are as follows:

Mr. F. G. Bowles (chairman)
Captain John Baird
Mr. Alfred Balfour
Mr. Aneurin Bevan (Minister of Health)
Mr. N. A. H. Bower
Mrs. E. M. Braddock
Mr. T. J. Brown
Mr. A. J. Champion
Dr. Richard Clitherow
Mr. V. J. Collins
Dr. Louis Comyns
Mr. Edward Evans
Lieutenant-Colonel C. H. Gage
Commander T. D. Galbraith
Mr. Andrew Gilzean
Captain William Griffiths
Mr. Somerville Hastings, F.R.C.S.
Mr. E. G. Hicks
Mr. George House
Mr. J. H. Hoy
Mr. C. W. Key (parliamentary secretary to the Ministry of Health)
Mr. R. K. Law
Mr. H. N. Linstead
Mr. D. L. Lipson
Sir Hugh Lucas-Tooth
Mr. H. G. McGhee
Commander J. F. W. Maitland
Captain Arthur Marsden
Mr. Frederick Messer
Mrs. L. A. Middleton
Dr. H. B. Morgan
Mr. R. H. Morris
Sir Henry Morris-Jones, M.R.C.S.
Mr. Arthur Moyle
Mr. Philip Piratin
Mr. Ernest Popplewell
Mr. John Rankin
Mr. J. S. C. Reid
Mr. D. L.-M. Renton
Mrs. Mabel Ridealgh
Mr. G. O. Roberts
Captain J. W. Snow
Colonel Malcolm Stoddart-Scott, M.D.
Mr. Henry Strauss
Dr. Barnett Stross
Dr. Stephen Taylor
Sir Wavell Wakefield
Sir Harold Webbe
Mr. J. L. Williams
Mr. H. Willink
Lord Willoughby de Eresby

The MINISTER began by saying that to get the measure on the statute-book this session it would be necessary for the committee to sit on Tuesdays, Wednesdays, and Thursdays each week, but if good progress was made sittings might later be reduced to two a week.

CENTRAL ADVISORY COUNCIL AND REGIONAL BOARDS

Mr. H. WILLINK moved a proviso that in discharging his duty to establish a comprehensive health service

> The Minister shall consult with the Central Health Services Council . . . and shall have regard to regional schemes to be submitted to him by the Regional Boards . . . for the proper planning and integration of all such services.

It was the aim of his party, he said, to improve the Bill, and the amendment raised two important principles. Under the Bill the council was given a duty to advise the Minister, but the Minister undertook no obligation to consult the council. Even more important was the second principle raised in the amendment. The Bill contained no provision for the planning of the personal health services of the country, or of any area, as a whole, and that was why the amendment introduced the phrase "regional boards" as opposed to "regional hospitals boards." Under the Bill there was no provision for planning regionally the hospital service. The regional hospitals boards were set up only to administer something which already existed—the hospital and specialist services provided in their area, and "provided" meant "provided by the Minister in their area." Did we really want this extraordinary centralisation under which the Minister's officers, professional and administrative, had entrusted to them the planning of the hospital services? True they must have the final approving power of a plan, but ought not some area or region closer to the people than Whitehall to have a planning function?

Mr. BEVAN declared that obviously the Minister would not set up a central advisory council if he did not propose to consult it. This council had unusually wide powers. It could initiate advice to the Minister. It was a self-motivating body and therefore had a much higher status than advisory councils usually possess. It could from time to time review the whole or any part of the health services, or any regulation the Minister proposed to make. It had the right to publish an annual report. If it was defined what the council should consult the Minister about, by implication it could not consult him on matters which were not defined.

The suggestion that the regional boards should have responsibility for drawing up and integrating an all-embracing health scheme for their areas Mr. Bevan described as "sheer planning pedantry." The boards would not only have to submit hospital-service schemes but also local health-service schemes and general-practitioner schemes. Each board would be working independently of the others. Each would have a different scheme, and we should have to spend the next few years in trying to bring about some relationship between them, and the health service would never operate at all. Responsibility for coördination rested where Parliament imposed it—upon the Minister of Health. That was where it should be. In the past the hospital services had been in the hands of independent rival competitive bodies, each denying its service to the others. In the future they would all be public services under an obligation to provide services which they could not deny to anyone. Therefore, the coördination of the service would be done by the common users of the service.

The more we put into this Bill of a defining character, he continued, the less elastic and resilient the service would become. He hoped that the committee would not make the whole service muscle-bound by unnecessary definitions.

Mr. J. S. C. REID hoped that there would be an appropriate organisation for each region. If the Minister adopted any sort of scaled pattern he would be in for trouble.

Mr. H. N. LINSTEAD felt that the Minister was prepared to give the central council a really effective part in building up the service, and Mr. BEVAN confirmed that, though the Minister could not put every regulation before the council, any regulation dealing with general health-service matters would be agreed beforehand. Continuing, Mr. LINSTEAD expressed his fear that coördination at a national level would mean that the Minister would be bound to develop his own regional

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machinery and that coördination in fact, from sheer necessity, would take place through his regional officers.

The amendment was negatived by 29 votes to 17 and clause 1 was ordered to stand part of the Bill.

SCOPE OF THE CENTRAL ADVISORY COUNCIL

According to clause 2 of the Bill it is the duty of the council "to advise the Minister upon such general matters relating to the services provided under this Act." Mr. R. K. LAW moved an amendment to leave out the word "general," for he feared it might debar the council from giving advice on particular matters. But Mr. BEVAN thought it inappropriate for an advisory body of 41 members to be able to subject the whole health-service administration to microscopic examination. Mr. LINSTEAD agreed that the council should not bother itself about detail, but thought that often only an expert body could decide whether a thing was a general matter or of highly specialised importance. Mr. BEVAN explained that if there was a special matter which the council thought required investigation, it could advise the Minister to refer it to one of the standing advisory committees. If there were no appropriate committee in existence it could advise him to set one up. The reports of the advisory committees would of course be available to the council as well as to the Minister, and Mr. Bevan promised to have the clause re-examined to ensure that the central council would have power to discuss these reports. On this undertaking Mr. LAW withdrew his amendment.

CONSTITUTION OF THE COUNCIL

Mr. H. G. STRAUSS moved to omit subsection (2) of clause 2 which provides that the Minister may, after consultation with the council, by order vary its constitution. Mr. BEVAN said the subsection had been inserted merely as a matter of practical administration. When the Central Midwives Board was set up it was found that it was impossible to vary the constitution without a new Act of Parliament. He was willing to make an alteration of the constitution subject to a negative resolution of the House, but not a positive resolution. The amendment was by leave withdrawn.

PUBLICATION OF THE COUNCIL'S REPORT

At the second day's sitting on May 15 Mr. F. MESSER moved the deletion of the Minister's power to refrain from publishing in whole or part the council's report where he deemed it contrary to the public interest. Mr. Messer could not imagine what kind of information the Minister might seek to withhold from the public in peace-time. Mr. BEVAN said that he had from the beginning accepted the principle that in a service which affected the people intimately the public ought to know what advice the council had tendered to the Minister. But there must be power to withhold information which it was not in the public interest to disclose.

Lord WILLOUGHBY DE ERESBY thought it should be remembered that under the Bill we were setting up a State monopoly in health services. Full publicity was one of the few safeguards against such a monopoly and one of the few stimulants to ensure that standards were kept up. But Mr. BEVAN resisted the amendment as it would overrule the Official Secrets Act. Dr. R. CLITHEROW suggested that it might be in the public interest that medical research investigations should not be disclosed prematurely. The amendment was negatived, but Mr. BEVAN agreed to Mr. Law's amendment that publication should only be suppressed after consultation with the central council.

Mr. REID pointed out that the central council's scope would be limited to the consideration of services provided under the Bill. Mr. BEVAN thought this would not matter as the service to be provided was comprehensive. But he admitted the council's scope might be limited in connexion with industrial health services, which would, he hoped, shortly be included in the scheme. The only reason it was not there now was that it was administratively indigestible to take all those services into the present scheme. We must see what sort of a pattern emerged before embracing an industrial health service. The educational services would also be slowly assimilated. One of the reasons why counties and county boroughs were made health authorities was because they were also education authorities, and it was hoped to avoid any rupture in the school health services. Clause 2 was ordered to stand part of the Bill.

PROVISION OF HOSPITAL SERVICES

On clause 3 Sir HENRY MORRIS-JONES moved an amendment postponing the appointed day for the coming into operation of the Act till after Jan. 1, 1950. There was, he said, a shortage of some 200,000 hospital beds. Many hospitals were antiquated and their equipment out of date. Nor had we the medical personnel to run these services; and the Armed Forces were still absorbing a substantial number of medical men. The health centres contemplated under the Bill would take time to build, and how were they to be got ready unless the appointed day was postponed?

Mr. BEVAN argued that if the hospital facilities were bad—and he admitted that they were bad in many parts of the country—the sooner they were rationalised the better. It would be disastrous if the National Insurance scheme came into operation and £30 million were collected from people towards hospital services which could not be provided. Furthermore, a long gap between the passing of the measure and its coming into operation would put the voluntary hospitals in a serious financial position. The amendment was negatived.

RESPONSIBILITY FOR THE PROVISION OF HOSPITALS

Mr. WILLINK moved an amendment taking from the Minister the sole responsibility for providing hospital and specialist services, and, instead, making it his duty to secure their provision "by local health authorities, hospital management committees, or boards of governors." Could the Minister, he asked, really form a view as to what was necessary in all parts of the country? It was disastrous that most effective hospital authorities should under this Bill cease to have the responsibility of providing hospitals for the people in their locality.

Mr. BEVAN resisted the amendment, which he said would change the whole character of the Bill. He had rejected all the alternative schemes put forward because they were impracticable and merely attempts to conciliate the various interests. Did Mr. Willink want the voluntary hospital authorities to continue to provide hospitals under the scheme? Mr. WILLINK replied that it had never been his idea that the existing voluntary hospitals should be included in the same lay-out or constitution as they were now. The point was whether they were to be autonomous bodies, or creatures and agents of the Minister. Mr. BEVAN, continuing, said that Mr. Willink wanted to have it both ways. He realised that the present hospital organisations were inadequate and needed to be rationalised, yet he wanted to argue that although all that should be done, the individual voluntary hospitals should be unchanged. There were about 1100 voluntary hospitals in this country, and a considerable number of local authorities. If the provision of the hospitals were left to autonomous bodies with indirect control there would be no guarantee that they would be able to fulfil their functions, and the only discipline the Minister could exercise over them would be the withholding of grants. Everybody with experience knew this to be a difficult and awkward way of influencing authorities. Moreover, the principle of indirect control ruptured the contract between the Government and the citizen. From the citizens of the country £30 million was to be collected on an undertaking to provide certain benefits in return, and yet it was now suggested that the carrying out of the undertaking should be left to independent bodies. A great deal had been said about the advantages of local responsibility. To whom were the voluntary hospitals at present responsible, and if a person wished to make a complaint to whom could he go? In the future there would be the house committee, the management committee, the regional board, and, what was very important indeed, there would be the responsibility of the Minister's department. In Mr. Bevan's experience the most sensitive instrument in the country for bringing about effective administration was a question in the House of Commons.

Mr. D. L. LIPSON said that he believed that the medical profession preferred this Bill to the white-paper, largely

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because it would not place them under the control of the local authorities. Dr. STEPHEN TAYLOR thought doctors were opposed to control by local authorities because in the structure of local-authority hospitals there were hierarchical staff arrangements. There were perhaps ten juniors, four in the middle, and one at the top. The number of promotions and the possibility of senior appointments was thus limited. The virtues of the voluntary hospitals, he suggested, sprang more from their internal staff arrangements than the peculiar method of finances. Indeed, this system of staff had been imported into local-authority hospitals with satisfactory results. There should be an effort to preserve the effective arrangements inside the voluntary hospitals. In the old days the voluntary hospitals certainly did a great deal of research, because they were the only hospitals. But since the municipal hospitals had developed, an enormous amount of research had been done in them. Furthermore, most of the medical research had been directly financed by the State Medical Research Council; in fact, the major medical researches were already directly financed by a nationalised organisation.

Mr. Willink's amendment was negatived by 29 votes to 13.

WHAT IS A SPECIALIST?

At the third day's sitting on May 16 Colonel STODDART-SCOTT moved an amendment to name consultants as well as specialists in clause 3. There were, he pointed out, specialists such as biochemists, pathologists, and even medical journalists who were not consultants, while in the industrial North, and in rural areas, some general practitioners, because they had the confidence of their colleagues, were called in as consultants, yet they had no specialist qualifications.

Mr. KEY said there was no definition of a specialist in the Bill. That would be left to the regulations which would be made under clause 62. Nothing, he claimed, would be gained by inserting the word consultants at this stage. A consultant might be what is often called a general-practitioner specialist. They did not want to bind themselves to take into the specialist service everybody who was pleased to call himself a consultant. It might be that in the early stages it would be necessary to use the services of less qualified people, whom they would not want to include in that list later on. He believed that this view was supported by the Royal Colleges as well as by the recent Hospital Surveys. Sir HENRY MORRIS-JONES suggested that consultant general physicians could not properly be described as specialists. Mr. WILLINK regretted that the language of this Bill tended to separate the medical profession into two classes—the general practitioner and the specialist.

Mr. SOMERVILLE HASTINGS asked whether the definition of the term specialist, which was to be made later, would be for all time or not. In the early stages many people who were perhaps general practitioners would have to be called specialists, but later everyone would hope that the specialists might be more specialised, and might be entirely consultants. He wished to know whether a change could take place in the definition, depending on supply and demand. Mr. REID asked whether a medical man might be at the same time a part-time specialist or consultant and also have status under the scheme as a general practitioner. Mr. LINSTEAD thought the difficulty lay in the structure of the Bill, and not in the substance of medical practice. In the Bill the word "specialist" was also used to cover trained people such as opticians and radiographers. It was certainly not intended that an optician who was a specialist under clause 3 should have beds at his disposal under clause 5. It would be wise, he thought, to use a separate word for those whom he would call for the moment consultants. The amendment was negatived, and Mr. KEY said that the term specialist definitely meant specialised medical practitioner. Thus it included the ophthalmologist, but the optical practitioner came under "medical, nursing, and other services."

DOMICILIARY VISITS

From the Minister's duty to provide the services of specialists "if necessary on medical grounds, at the home of the patient," Mr. MESSER proposed to delete the words "on medical grounds." It would be assumed that a specialist could not attend the home of a patient unless the patient was too ill to go to hospital. Mr. KEY explained that the intention of the words was to ensure that the specialist was only called to the home of a patient in case of need and not because of some whim on the part of a patient. Mr. LINSTEAD thought the words "if necessary" were sufficient. There might be all sorts of grounds not necessarily medical why the patient could not go to the specialist. Mr. WILLINK was unsatisfied with the drafting of the whole paragraph. He thought it should be made clear to people that it does not lie within their own choice whether they have a second opinion. He suggested some such wording as "on the advice of the general practitioner, at the home of the patient." Mr. A. GILZEAN thought the committee were darkening counsel with a multitude of words, and the phrase was left untouched.

PLANNING AGAIN

Mr. WILLINK moved an amendment placing on the Minister the obligation, in considering the hospital accommodation and services to be provided, to have regard to plans prepared and recommended by each regional board, and to the advice thereon of the central council. According to the Bill the functions of the regional hospital boards were purely administrative. The amendment also laid a planning duty on them. Further, since the Minister was not the source of all knowledge, the Opposition believed there would be many questions arising out of the regional plans on which the advice of the central council should be taken.

Mr. KEY, in resisting the amendment, said that the service was to be a growing developing service, not something circumscribed by a paper plan, and these development schemes would result from discussions between the regional boards, the Minister, and the boards of governors of the teaching hospitals. A great deal of time could be wasted on the evolution of paper plans by bodies which ought to get down immediately to the day-to-day improvement of the service. The central council was an advisory body, and it was not its duty to deal with the details of administration. They would ask for its advice on special things, not for interference in the development of the service.

Mr. HOPKIN MORRIS supported the amendment because while not detracting from the power of the Minister it gave an added interest to the regional boards. Mr. STRAUSS objected to Mr. Key's picture of a vigorous, go-ahead Ministry and an obstructive slow-moving profession. Nothing could be further from the truth. The Ministry had a comparatively miserable record in dealing with the sensible suggestions put forward by the profession.

Mr. BEVAN intervened to say that if the amendment were accepted it would mean delay. First 16–20 regional boards would be set up, and then 16–20 plans would be conceived in the boards. They would be a sort of immaculate conception because the Ministry would have to keep entirely away from them. Then they would go to the central council and only then would the Ministry start to consider them and perhaps touch them up here and there. That seemed to him the wrong way of setting about the task. There were common features about all the regions—for example the 1000-bedded hospital under its management committee. That was the kind of principle we wanted to have running right through the service. We did not want dull uniformity, but there must be common principles, and he wanted to inject those principles into the plans as they were being prepared. That was why he wanted to have consultations with the boards while they were preparing their plans—not to impose the will of the Ministry but so that the plans were of the kind the Minister could accept and put into operation right away.

Mr. WILLINK suggested that with the experience gained by the Hospital Surveys the regions could be defined quite soon and the boards designated long before Jan. 1, 1948. Their administrative functions could be transferred to them when the Bill was in operation, and meanwhile they should be encouraged to do their regional work in consultation with the Minister. Mr. BEVAN, in reply, said the first thing he proposed to do was to have the regional boards appointed, and the second to ask them to prepare draft plans. The amendment was withdrawn.

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POINTS RAISED

Replying to points put to him on the question that clause 3 stand part of the Bill, Mr. BEVAN said he did not pretend to be a judge of the merits of homœopathy, nature healing, or other forms of treatment. All he had to do was to provide a service that Parliament said was to be provided, and that was the service which the medical profession declared to be necessary. If he went beyond that he was in uncharted seas. He must accept the professional examinations. Many bodies placed unnecessary limitations on themselves, because practitioners would be perfectly entitled to give their particular form of therapy if they had the general qualifications. What he could not do was to say that in the State service they would be able to give any of those forms of therapy by practitioners who had not qualified in the normal way. With regard to homœopathic institutions, he could not say whether they would be in or out. If they were brought in it would be for the purpose of providing their own particular form of treatment. They might be left outside when the committee reached other parts of the Bill. He agreed that it was vital that general practitioners should be encouraged to visit their patients in hospitals. To take a patient away from the general practitioner, hand him over to a hospital and then hand him back to the general practitioner, was a wholly bad procedure; bad for the patient and very bad for the doctor. He wanted to encourage the general practitioner to identify himself more and more with the hospital service. There were many hospitals from which general practitioners were excluded. But he could not say in the Bill that any general practitioner who called himself a specialist should be treated as such. Neither could he say that because a general practitioner had one or two successes with a particular ailment he could therefore call himself a specialist. That was a matter which was the subject of abuse at present, because the medical profession had laid down no definition; but he was going to lay that duty upon them. Clause 62 required the Minister to make provision with respect to the "qualifications, remuneration, and condition of service" of any officers employed by any body constituted under the Bill. There was nothing to prevent any surgeon from being a general practitioner. General practitioners took special qualifications and remained general practitioners. That was quite normal. He proposed to ask the appropriate body—the Central Advisory Medical Committee in the first instance, because the central council would not be established for some time—and he would consult the medical profession as to what body they considered ought to advise him on the definition of a specialist for the purposes of the scheme. They were not writing letters on brass. All kinds of changes were taking place in the science and art of medicine, and therefore definitions must always be regarded as liable to alteration as the health service grew. In the meantime, many of the general practitioners, who had shown by qualification and experience that they could be properly described as specialists, could be used for that purpose until the specialist service had been properly established. If the service had to pay a higher remuneration for consultants he wanted to secure a genuine second opinion. He did not want a second opinion on the same level. It was necessary, therefore, to have some objective definition of a consultant. Whether the term used was "specialist" or "consultant" did not seem to matter; what was important was the content, not the description, and if the description was offensive, there was no reason why it should not be changed. He would be happy if dentists could be provided everywhere as part of the equipment of hospitals, but unfortunately there was a shortage of dentists and emergency steps would have to be taken to train dentists.

It was an awful business that poor people who were deaf should be exploited. Appalling prices were being demanded for hearing-aids. He had said he was reasonably optimistic about the prospects of a standard hearing-aid and when it was perfected he would see that it was made available without exploitation by private people in its sale. Arrangements would have to be made for the proper servicing of the equipment at hospital.

Clause 3 as amended was ordered to stand part of the Bill.

PRIVACY FOR PAYMENT

When the committee reassembled last Tuesday, it proceeded to consider clause 4. Mr. REID moved an amendment to alter "may" to "shall" in the passage authorising the Minister to allot to paying patients single rooms or small wards not otherwise needed on medical grounds. He thought the discretion should be either abolished or delegated to the hospital committee, because the Minister was too remote. The situation might alter from week to week; and even a system whereby the Minister acted on the advice of local committees would not be effective because of possible delay.

Mr. BEVAN said that in practice the decision would be entirely local, but the Minister must have a power of veto for use in times of crisis. The proposed amendment would make administration inflexible rather than flexible. SIR HAROLD WEBBE said that Whitehall might certainly have to control a reserve of accommodation, but the Minister could never exercise day-to-day control. Mr. REID withdrew the amendment.

Mr. MESSER moved that "on medical grounds" should be deleted from the passage which authorised the Minister to make this accommodation available to paying patients when it was not needed by any other patient on medical grounds. It might sometimes be advisable, he suggested, to put non-paying patients in small wards or single rooms because they were unsuitable for large wards. Mr. BEVAN said that "medical" was to be widely interpreted; it applied not only to the patient concerned but to other patients as well. The amendment was withdrawn, and it was directed that the clause should stand.

PRIVATE PATIENTS IN HOSPITAL

Mr. REID moved an amendment to clause 5, by which he sought to transfer the responsibility for allotting accommodation for private patients from the Minister to the regional hospital boards. He contended that the decision must be made on a regional basis, because of the varying number of beds in different districts. The local hospital committee was not fitted to make a decision, because it could not judge the needs of the whole district; but rule-of-thumb control by the central authority was equally to be deprecated.

Mr. BEVAN replied that to make the Minister the instrument of the regional boards would be to reverse the principle of the Bill. There certainly would be pay-bed accommodation, because there must be diversity in the service, and more especially because association of the various specialists in hospital was desired. He resisted a plea that more specific allowance should be made for paying patients; this, he said, would smack of class discrimination. The regional boards would be consulted. Mr. REID withdrew the amendment.

Mr. MESSER sought to have "urgently" deleted from the passage prescribing that private accommodation might be available for any patient who urgently needed that accommodation on medical grounds. Mr. BEVAN said that management committees might have difficulty in interpreting the clause if the amendment were adopted. In pay-blocks there was, he said, a firmer contract between patient and specialist than elsewhere; if the beds were to be assailed at any time, the contract might be constantly interrupted, and the specialist would not know where he was. Mr. PIRATIN agreed that confusion might arise in the case of the private patient who had already entered the pay-block. But what of the patient who had not entered? He opposed the principle of two forms of service. Mr. BEVAN agreed that there was an argument against all discrimination. But those who paid were in hospital on medical grounds in the same way as those who did not pay. How was a decision to be reached? Where were the paying patients, if displaced, to go? The amendment was withdrawn.

Mr. MESSER moved that the second subsection of clause 5 should be left out. This subsection reads:

> (2) The Minister may allow any specialist serving on the staff of a hospital providing hospital and specialist services to make arrangements for the treatment of his private patients either at that hospital or at any other such hospital, and may make available for that purpose the special accommodation aforesaid, and in that case the charges prescribed under the last foregoing subsection shall not

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include the cost of any services rendered by the specialist, and regulations may prescribe the maximum charges to be made and recovered by any such specialist in respect of the treatment of his private patients under this subsection.

He appreciated, he said, the Minister's difficult position; he was doing away with long-established custom. The system had been for the general practitioner to call in the specialist, who admitted the patient under his charge to hospital. The specialist was paid for his services. When the specialist was independent, he could use the voluntary hospitals. But now specialists were going to be paid, and hospitals were to be publicly owned. He feared that there would be better treatment for those that could afford to pay. Too much attention should not be given to the views of the medical profession and their representatives. "If you get the colleges behind you, you're pretty safe," and the rest could be disregarded.

Mr. SOMERVILLE HASTINGS agreed with Mr. Messer that doctors gave more attention to patients who paid. Why should anyone now want to pay unless he expected to get better treatment by so doing? Although some doctors took the opposite view, most liked to take paying patients in hospital. He could see that there was a case for pay-blocks to attract doctors to the hospitals, but he could see nothing to favour the use of side-wards for private patients. Other patients would think that the near-by private patients were getting better treatment, and the two should not be mixed.

Mrs. E. M. BRADDOCK considered that specialists should be entitled to bring in patients and to charge them, provided that there was no interference with other patients. This system had been tried with success in Liverpool. The best specialists would be debarred unless this concession were allowed; but it should not extend to full-time specialists.

Dr. TAYLOR contested the proposal for pay-blocks, with patients paying their doctors, which, if adopted, would be open to abuse. The Minister was being generous to the specialist and was subsidising his activities, since the patient would be paying only some of his fees and not others, such as those for blood-counts. The only way to dispose of this anomaly would be to make conditions so attractive that specialists would elect to join a whole-time service.

Sir HAROLD WEBBE suggested that the doctor would not undertake his onerous task just for money. Captain JOHN BAIRD said the system might be abused. He quoted the case of a patient with a threatened mastoid who had been offered a bed immediately in the pay-block but had been told that he must wait for admission to the public wards. Mr. LIPSON said that the Bill would mean a big change for specialists; some concessions must be made to win their coöperation. He considered that, at first, side-wards should be used for private patients. The Bill was not the last word; doctors should be given time to adjust their minds.

Mr. PIRATIN said that this subsection favoured the specialist. If the doctor's monetary interest was so slight, why should a full-time service not be adopted now?

Dr. MORGAN thought a part-time system was not desirable, but it was necessary to be practical. With control by colleagues, management committees, and regional boards there was little risk of abuse.

Mr. BEVAN admitted that this subsection had caused him more anxiety than any other part of the Bill. There must be a bias in favour of a free health service; but it was being inserted into a context with the opposite principle. The granting of favourable conditions to the specialist would secure a higher standard of treatment for the patient. The aim was to persuade specialists to spend all their time at hospital. It would be disastrous if, through rejection of this principle, a rash of nursing-homes were to grow up; the specialist would thereby isolate himself. In the past specialists had exercised considerable administrative control over hospitals; this would now disappear, and it would no longer be necessary for hospitals to placate specialists in order to build up revenue. Since in future the money would come from impersonal sources, hospital staffs would no longer need to give special treatment to special people. Mr. Piratin had opposed the idea of specialists treating patients in separate hospitals, but this had been allowed for the sake of mobility and to overcome inbreeding; by spreading specialists over hospitals, the chances of abuse were limited. The whole momentum of the scheme would be in the direction of a whole-time salaried service for specialists. Many young ex-Service men who were now waiting for the institution of the scheme would, under the present system, have had to wait years for the plums. The apparatus must be used freely by the profession, but internal administration should as far as possible be in lay hands. The amendment was withdrawn.

Mr. LINSTEAD moved an amendment to allow the same facilities in hospital for general practitioners as for specialists. This was supported by Colonel STODDART-SCOTT, who wanted the general practitioner to identify himself more and more with the hospital service. In some provincial cities practitioners were treating their own patients in pay-blocks. Mr. BEVAN agreed that general practitioners should have access to patients in hospital. A general practitioner who joined the service could treat his paying, as he could treat his free, patients, except where specialists were on the staff; it would then be a matter of professional adjustment. Mr. LINSTEAD suggested that the clause discriminated against the general practitioner. Mr. BEVAN, in reply, pointed out that while the practitioner's contract was with the executive council, that of the specialist was with the regional board. The amendment was withdrawn.

Mr. STRAUSS moved that the last part of the subsection, which authorises the control of specialists' fees by regulation, should be deleted. The aim, he said, was supposedly to limit incomes. If the specialist's income were to be limited, there would be unfair discrimination as against the rest of the profession. The general practitioner might come into the service or stay out, but the specialist must enter the service to get his patients into hospital. Why deprive the first-class man of first-class prizes? While some might be content to work for little or nothing, others entertained ambition, which must be respected. What limit did the Minister propose to set—£8500 a year? If he said "yes" the regulation would be valueless. If he said "no" then why should leaders of the medical profession earn less than the chairman of the Coal Board? How was the regulation to be enforced? It would still be possible for the specialist to earn an unlimited income by practising from a nursing-home—the reverse of the Minister's intention. The best men were needed in the profession, even if they made large incomes. This subsection differentiated against the specialist only; its terms were futile and excited doctors' suspicion.

The committee then adjourned.

QUESTION TIME

Production of Streptomycin

Mr. P. WELLS asked the Minister of Health to what extent streptomycin was being produced in this country; whether it had been used in connexion with the treatment of tuberculosis; and with what results.—Mr. A. BEVAN replied: A number of firms are carrying on research and development in connexion with its production but the quantity resulting from these activities, which are on a laboratory scale, is as yet very small and it has therefore not been possible to use it in the treatment of tuberculosis.

Private Mental Homes

Mr. J. R. BATTLEY asked the Minister how many patients there were in mental homes and institutions which were run for private profit; and what was the percentage of the number of patients discharged from such homes and institutions as relieved or recovered.—Mr. BEVAN replied: On Jan. 1, 1946, there were 2693 patients in mental homes and institutions managed for private profit under the Lunacy and Mental Treatment Acts. The number who left or who were discharged as recovered or relieved during 1945 amounted to 66% of the number admitted.

Accommodation in Sanatoria

Mr. W. SHEPHERD asked the Minister how many patients suffering from tuberculosis were awaiting admission to sanatoria.—Mr. BEVAN replied: In England and Wales, at March 31, 1946, the number who had been on waiting-lists for institutional treatment for longer than ten days was about 6200. The principal limitation is staff, not beds, and we are doing our utmost to improve recruitment in that respect.

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Ministry of Health Circulars

Lieut.-Colonel H. R. MACKESON asked the Minister how many circulars and instructions had been issued by his department since June, 1945.—Mr. BEVAN replied: Since June, 1945, my department has issued 265 circulars for the guidance of local authorities and other bodies.

Experimental Health Centres

Mr. S. HASTINGS asked the Minister of Health whether he was proposing to set up experimental health centres so that further experience might be gained before the National Health Scheme comes into operation.—Mr. BEVAN replied: I do not think this would be practicable in the light of present statutory powers. I think it is better to press on with the National Health Service Bill and then to gain experience under it, as quickly as possible.

Register of Tuberculosis Nurses

Mr. W. SHEPHERD asked the Minister if he would arrange for a register of T.A. nurses to be set up in order to increase their prestige and attract the numbers which were necessary.—Mr. BEVAN replied: I am at present considering rules submitted to me by the General Nursing Council to establish a register of State-registered nurses who are trained in the nursing of persons suffering from tuberculosis.

Towards Social Security

Circulars

BEING in the home of a friend one Saturday evening, I remember his wife bringing in letters and casting one aside unopened saying, "It's only a circular." Later that evening the friend and I, ruminating on life in general, recalled the great care he had taken to draft that particular circular, and his anxiety as to how it would strike the critical judgment of his wife. His observation of how it was received gave him some insight as to the manner in which his effusions generally were treated.

For the body politic, circulars in the right doses can be stimulating; in excess they can be poisonous. Unlike Acts, orders, regulations, and rules they do not of themselves have any legal effect; that is to say the opinions and desires they express, while influential, do not have the full status of a mandatory decree. The only significant exception is where there may be some Ministerial determination of a date or sum of money or other fixed thing, and the circular may be the convenient means of making it known. In such circumstances it should cite the legal provision under which the determination is made.

It would be instructive to anyone who does not already know the facts to ask any local authority to show the library of circulars received during the war period on matters of Civil Defence; to study them all properly might well take longer than the war itself. The explanation is simple. Various departments of State were entrusted with high responsibility, which could only be executed through local persons. Local authorities, being already constituted and housed and officered, were the natural vehicle of local administration, and it was assumed in Whitehall that all that was necessary was to issue a circular and leave the matter there. The town clerk and his subordinates were faced with new ones almost every day, and though the flow seemed to be unrestricted, the number of copies of each was apt to be small. Hence, at one town hall known to me, every circular was laboriously duplicated inside the building for distribution to every department which might conceivably be concerned. Otherwise they could not possibly receive proper attention.

At one stage in the war the Cabinet had to intervene and give instructions that circulars should be phrased more concisely and that decorative flourishes should be omitted.

Only rarely was any official index issued; local people were left to find their way about the documents as best they could. Moreover circulars were hardly ever cancelled. The passage of time obviously left some without importance, but nobody knew when an action might not be challenged as being contrary to some quite early document. In some parts of Whitehall it became understood that the drafting of circulars was to be handled by a particular rank. An officer who did not maintain his regular output might look as if he were failing to do his job.

There is, of course, a right and a wrong technique in all things. It is wrong to suppose that an official sitting in monastic seclusion and basing his judgment solely on papers, reaching him from busybodies or people who are afraid to take responsibility, can always write a masterpiece of lucid English containing the essence of wisdom. He forgets that probably the best people on the spot have never written to him at all, and in fact know far more about the job than he does. A shining example of a good technique was reached by the London Civil Defence Region by the end of the war. The chairman spent more time visiting local authorities and questioning all ranks than he did at his office desk, and his subordinates were encouraged to see as much as they could, within reason, of work carried out in various localities. Then when a circular letter was composed he had a draft submitted for comment to representative town clerks, engineers, chief wardens, or others interested, and after meeting a group of them and hearing their criticisms he had the draft put right—or sometimes scrapped altogether! Consequently, by the time the circular was issued it represented the highest level of thought and experience of those actually conducting the operation, and it proved of practical help to others.

It is earnestly to be hoped that in operating the National Health Service all persons who are minded to issue circulars will first saturate themselves with first-hand study of the problems on the spot, and write always with the likely reaction of "the other fellow" at the forefront of their minds.

JUSTINIAN.

Medicine and the Law

What is a Specialist?

WHILE the House of Commons, in committee on the National Health Service Bill, has been discussing the position of a "specialist" and the difficulty of evolving a statutory definition of a "specialist," a case in the Bloomsbury county court on May 16 shows how in ordinary life the problem is solved.

Dr. Walter F. Hannay, described in a report of the case in the lay press as "a Harley Street doctor, practising as a specialist," sued the widow of Captain Clifford Ramsay (who died in 1943) for fees amounting to £18 18s. The law on the subject is well enough established. There is a legal presumption that a registered medical practitioner performs professional services for reward. The onus would lie upon the patient to prove any allegation that the parties had agreed that the practitioner's services should be gratuitous. The amount of the fee, if not agreed in advance, will be what was in the circumstances reasonable. As in the case of any other kind of contract for work and labour, no payment can be recovered for work which is substantially valueless owing to negligence or want of the proper degree of skill professed. It is by no means an uncommon experience, when a claim for unpaid fees is disputed, to find that the defendant denies the reasonableness of the charge and challenges the value of the services rendered. In Dr. Hannay's case the widow described the fees as exorbitant and the plaintiff's services as not only valueless but detrimental. The plaintiff was cross-examined as to his qualifications and it was put to him that he had not a single qualification which justified him in holding himself out as a specialist. He answered that he had qualified in 1928 and had worked at the National Heart Hospital with members of the medical staff as a clinical assistant. He had been appointed as a clinical assistant by eminent heart specialists.

The court gave judgment for Dr. Hannay for the sum claimed (which represented eight visits) with costs. The test, said the registrar, was whether he was or was not practising as a specialist; the plaintiff had been called in as such by experienced solicitors on the patient's behalf. It was not for the defendant in the circumstances to say that the plaintiff had no justification for calling himself a specialist.

Mr. John Douglas McLaggan has been appointed aurist to H.M. the King. Mr. McLaggan is surgeon-in-charge of the ear, nose, and throat department of the Royal Free Hospital, London.

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Letters to the Editor

FOWLER'S POSITION

SIR,—Lane brought the Fowler position to Guy's from the States in November, 1906. I do not know whether Moynihan, Stiles, or any other of the travelling surgeons had done so before. I became Lane's house-surgeon in January, 1907, and have used it ever since for many purposes. It would be a pity for it to fade into extinction because it has failed for one purpose when used in a modified form.

Neither Mr. Spalding nor Sir Heneage Ogilvie speak of the true Fowler's position. In this the patient is sat up in a position nearly erect, or inclined back at an angle of not more than 45°. But he has to be kept there. Lane saw the patients slipping down, and one day popped a pillow under the patient's thighs, screwed up its two upper corners, tied bits of bandage on to each, and fixed the other ends of these to the head of the bed. Thus came the Lane pillow, or the "donkey." No-one ever has, ever does, or ever can keep a person in the true Fowler's position without it. What Mr. Spalding and Sir Heneage disapprove of is an inefficient type of it. "The difficulties entailed to the patient and nurse"; "the considerable muscular effort"; the "clenched hands, and dug-in heels"; the "pink cheeks of the nurses who struggled hourly" are results of this bastard modification and none of them occur with the true Fowler position. Sir Heneage's "tense face" and "braced neck" may; but these are due to one of the commonest bits of bad nursing that one sees today. It is that when the nurses have sat the patient up they do not so adjust the top pillow that the head can rest, in sleeping and in waking, without any muscular exertion, in a position which is comfortable and in which he can breathe through the nose. Often he is left to balance his head with his own muscles, with the result that as these relax with sleep either the head topples sideways with a jerk that wakes him up or falls back and he sleeps staring at the ceiling with his mouth open.

So much for the position. What about the use? Fowler's position was devised for cases of local peritonitis which was not yet localised, notably acute appendicitis. In those days it was considered inadvisable to operate on appendicitis unless caught within 48 hours. "Free fluid has escaped into the peritoneal cavity. Do not disturb it till it is shut off. To open the abdomen scatters it all over the peritoneal cavity and invites a general peritonitis." Such was the teaching of the day.

What next? Lane, whose mind was always darting in new directions, applied it to his cases of gastro-enterostomy. The patient was sat up and given fluid per rectum at the rate of half-a-pint per hour for 48 hours, 24 pints in all, a piece of nursing technique that has been lost. Then he used it for his colectomy cases. Then the gynæcologists took it up and they began to get thromboses. And so the pillow under the thighs—not knees—was thrown aside and the bastard Fowler came into being. The reason for the thromboses, however, was not the pillow, but the fact that every time the surgeon opens the abdomen he interferes with the venous circulation. The more ligatures he puts in the more he does so—and the gynæcologists most of all, because their ligatures are close by the point at which the femoral and iliac veins form a V when Fowler's position is used.

Many abdominologists have given up watching a case of appendicitis at any stage. That is their business. But there may still be doctors who get a case where there is no surgeon or get one in a situation where the surgeon ought not to operate. I had one in a cargo-boat carrying emigrants on the way to Buenos Aires just after I left Lane. The only place to operate would have been the chart table, but you could only get round one end of it and could not get to the other side at all; and I maintain it would have been malpraxis for the most expert surgeon to have opened the abdomen on it for a simple case of acute appendicitis. And so when a Russian Jew boy from Odessa developed appendicitis I sat him up in the hold in one of the metal cots that, on the voyage out, replaced beef, and his mother kept the rectal infusion going for the desired time without a stop. She had all the intelligence of her race behind her maternal care and love; but as a result of this experience I do "dispute the difficulties entailed to the patient and nurse by the maintenance of Fowler's position."

It was in 1916 that I conceived the idea of applying Fowler's position to the transport of the wounded. Two brilliant joiners in my ambulance, Sgt. Radmore and Pte. Parker, made suitable chairs, which we put on to mule-litters, and we sent all our "guts" and chest cases over the 10 miles from Kalmora to Karasauli in Radmore chairs on mule-litters. In Palestine we lost the litters, but kept the chairs. To the Jordan valley Colonel (now Sir Henry) Wade brought one of the first surgical teams that were the embryo of all that has developed in surgery in this war; and in a tent there might be daily seen, sitting up in Fowler's position, cases of bullet wounds in the upper abdomen and chest. Wade would with delight take visitors to see these triumphs of British surgery—cases getting well without operation. And they did not get thrombosis and embolism. Can anyone quote one case of embolism where Fowler's position has been used without the abdomen being opened?

Then came the influenza pandemic. In that disease I believe that when bronchiolitis supervened the proper Fowler's position gave the best chance for life. Its perfect rest enables such ventilation as still exists in the lower lobes to be carried on. I will agree that, with the bastard type, the hourly heaves of pink-cheeked nurses would have taken away the patient's every chance. It is the right side of the heart that matters.

Since then I have used Fowler's position widely in diseases of the upper respiratory tract—in acute sinusitis, in securing eustachian drainage, after drainage operations, or to prevent the headache of the plugged nose (e.g., after the septum operation). But always have I been faced with a prejudice, tantamount to refusal, against the use of the pillow under the thighs.

The dominating influence of abdominal surgery in the last 25 years has spoilt Fowler's position. It would be a pity if a continuation of that influence caused it to be abolished now that the abdominologists are finding that the bastard Fowler is unsuitable for a condition for which the true Fowler was not devised.

But in the passing of the bastard I am glad to find that a young Guy's man is going back to the teaching of Mr. Symonds (Sir Charters) before ever Lane went to America. He was great on the prevention of thrombosis and embolism and had his appendix cases nursed for a given number of hours first on the back, then on the left side, and then on the right; but whether the periods were 8, 12, or 24 hours, I fear I have forgotten.

Guy's Hospital, London, S.E.1. T. B. LAYTON.

TOLERANCE TO OCTYL NITRITE IN ACHALASIA OF THE CARDIA

SIR,—In your issue of May 18, Dr. Robson and Dr. Wilkinson report a case of achalasia of the cardia in a girl aged 13 years who was treated with inhalations of octyl nitrite given 5 minutes before a meal. The cardia was seen to relax on X-ray screening 1½ minutes after the inhalation and was apparently still patent 4 minutes later.

It is my experience that the action of octyl nitrite on the cardia is transient and rarely lasts longer than 5 minutes, so that an inhalation 5 minutes before a meal is not likely to have much effect, and I am surprised that improvement was noted in this case. It is disappointing that the child was not screened after the apparent tolerance to the drug was observed, as I should have expected the action to be still present, possibly however showing a more rapid response to the drug but of shorter duration. This effect was noted in my cases previously reported, and may account for the apparent tolerance in Dr. Robson and Dr. Wilkinson's case. The best use of the octyl nitrite inhaler is after a meal. The food accumulates in the dilated œsophagus, and, when the drug is inhaled, is suddenly released into the stomach. Actually, my patients prefer to take two or three small inhalations during the meal when they feel the food obstructing, and one at the end.

It may be of interest to mention the effect of regular use of the inhaler in my four patients reported in THE LANCET of Dec. 30, 1944. No tolerance to the drug has been noted and the unpleasant side-effects are not noticed at all now. All have gained weight and grown

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in height, one child gaining 1 st. 4½ lb. in two years. The others are still slow in gaining, however. The children rarely vomit, unless they omit to use the drug, and no toxic effect has been noted on the blood. However, two interesting side-effects have been observed. Three of the children (the fourth has not been seen by me recently) show enlargement of the parotid glands, and in two of these the submaxillary glands are also enlarged. This enlargement appears to vary from time to time but causes no disturbance and was not actually noticed by the parents. A possible explanation for this is that the repeated use of the inhaler causes drying of the mouth and stimulation and hypertrophy of the salivary glands. The other interesting phenomenon was the development of lobar collapse of the lung in two of the cases. This responded to treatment and in particular to frequent steam inhalations, suggesting that the repeated octyl nitrite inhalations cause drying of the bronchial secretions, so producing a sticky mucus which is a potent predisposing cause of collapse of the lung. I have therefore recommended steam inhalation for my patients before going to bed as a routine prophylaxis.

University College Hospital,
London, W.C.1. C. ELAINE FIELD.

BRUCE WOODCOCK *v.* FREDDIE MILLS

SIR,—The two Anglo-American boxing matches held last week deserve the attention of doctors. In the light heavyweight match between Mills and Lesnevich at Harringay Mills was apparently "out on his feet" in the second round but with much courage fought his way through until he was knocked out in the tenth round. In New York Woodcock is said to have been winning his bout with Mauriello until the fifth round, when he "ran into a right hand punch" which knocked him out. He had a laceration of his scalp which required four stitches, and this, according to the boxer, was caused by a collision earlier in the round after which he had a loss of memory for the remainder of the fight.

How much cerebral injury has been sustained by these men is difficult as yet to judge, but it may be appreciable. With comparable signs of injury produced by other means one supposes that both would have been rested in bed for ten days and forbidden to take any strenuous exercise for at least six weeks. In this instance, however, Woodcock has been allowed to fly home 36 hours after the fight and both are resuming training in a few days so that they may be pitted against one another on June 4.

There seems, unfortunately, to be no legislation to enforce a more adequate medical supervision of our boxers, although we are unlikely to have, let alone deserve, world champions if we treat them in this way. One method, however, exists for ensuring that unfit men do not fight, and this is through their medical examination. If the doctor who will examine these men finds that the facts are as have been reported, he should have the courage to say that he will not give the necessary certificate of fitness until a proper time has elapsed after the last fights, getting, if need be, a second opinion from a neurologist in his support. In doing so he will be benefiting not only the boxers concerned but the whole sport.

Coulsdon, Surrey. E. CUNNINGHAM DAX.

MORYL

SIR,—Our attention has been called by several medical men to what would appear to be somewhat misleading and, in parts, inaccurate reports in some daily papers following the inquest at Croydon on a patient who died in the Croydon General Hospital after an injection made from crystals of 'Moryl.' These reports referred to moryl as being a "banned drug," or, again, as being "a drug which in 1942 a firm had been asked to withdraw." This was not the evidence at the inquest nor is it the fact.

We are the manufacturers of moryl and at the time of the Oxford inquest we decided that the package and its accompanying literature might be open to misinterpretation. We at once took steps to call in the particular blue package containing moryl crystals and then reissued it in an entirely new packing with a new colour scheme and new accompanying literature. This was all done entirely by the voluntary decision of this company and not by direction from any authority. In view of the very large number of members of the profession who are using moryl, we would be glad if publicity could be given to the fact first of all that the daily press was misleading in the report, and secondly that moryl in the Liquid form, in the Tablet form, and in the Crystalline form—each form being issued for a different purpose to be used in a different way and with appropriate directions—are still available and in full supply.

The package used in the Croydon case referred to was supplied to the hospital pharmacist's direct order in the crystalline form 5½ years ago, and part thereof was used prior to the injection in question. In the light of this fresh incident, it would appear again necessary to ask hospital dispensaries to examine their stores and return for free exchange any moryl crystalline substance in the blue packing.

London, W.1. SAVORY & MOORE LIMITED.

AMINOTHIAZOLE IN THE TREATMENT OF THYROTOXICOSIS

SIR,—In your issue of May 18 (p. 731) Dr. Perrault and Dr. Bovet report favourably on the use of aminothiazole in the treatment of thyrotoxicosis. In particular they state that it is superior to thiouracil in that it does not produce such toxic symptoms as cyanosis, jaundice, albuminuria, or blood changes.

Through the courtesy of Messrs. May and Baker Ltd. we were early acquainted with the enthusiastic claims being made for aminothiazole and were supplied with a stock of this substance for therapeutic use. Thirteen cases of thyrotoxicosis were treated with this drug and the results were so unfavourable that we did not feel justified in continuing its use. Certainly it will control thyrotoxicosis, but in our experience it produces toxic reactions far more often than thiouracil. Recently we have had the opportunity to discuss our experiences with French colleagues and learnt that in certain French clinics a similarly unfavourable impression has been obtained.

We hope shortly to publish the results of a comparative trial of several antithyrotoxic drugs and in that report we propose to give full details of our experiences with aminothiazole. In the meantime we feel bound to advise physicians against its use, at least until evidence from further trials is available.

University College Hospital Medical School. H. P. HIMSWORTH.
M. E. MORGANS.

MASS RADIOGRAPHY

SIR,—Does Dr. Brailsford mean that mass radiography should be given up, in spite of the fact that many cases of open tuberculosis have been detected by it? His opinion that some of these cases refuse treatment and continue to infect others is surely not a fault to be laid at the door of the mass miniature radiography scheme.

In one part of his letter of May 18 he deplores the fact that the essential task of "sifting the miniature" is done by "the least experienced" member of the team, and later he goes on to say, in effect, that the scheme does little, if anything, to eradicate tuberculosis. From his remarks it would seem that, no matter how competent the medical officer was, it would make no difference in the long run. This I find hard to believe, and I am of the opinion that the miniatures should be viewed by a tuberculosis officer of experience and by a radiologist, as is done in Manchester. The fact is that in this area many unsuspected cases of tuberculosis have been found and have accepted and benefited greatly from treatment.

Manchester, 2. W. MACL. E. TOPPING.

THE TUBERCULIN-TESTED CHILD

SIR,—Dr. Brian Thompson's figures (May 11, p. 716) are reassuring. Out of 249 Mantoux-positive children under the age of five years who had a definite history of contact with tuberculosis, only 4 died. Between this and the so-called alarming statements of pædiatric physicians it is interesting to place the figures of a pædiatric phthisiologist, W. F. Richards (*Tubercle*, 1944, **25**, 60). He showed that of 229 children under five years suffering from primary tuberculosis, and in the best sanatorium conditions, 13 died.

But mothers need more than a statement of the probability of their child dying. In Dr. Thompson's group of 462 children under the age of five years, 21

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were originally Mantoux-positive without known contact. The first question that their parents must ask is whether they need be institutionalised. If home conditions are very bad or if the child has a cavitating primary focus or constitutional disturbance, the answer is clear. But in many localities these children are sent to hospital or sanatorium without this type of indication and before even an inquiry has been made as to whether there is an infector living at home. Once in hospital it needs a bold physician to send them home again. These children are mentally more susceptible to institutional life than their older brothers, and it has been shown that their average stay in hospital is inversely proportional to their age.

The figures which I most wish to see are the comparative mortalities between children with primary tuberculosis who have stayed at home, provided that there was no infector therein, and those admitted to sanatorium with no other signs than an uncomplicated primary focus, a positive skin-test, and a sedimentation-rate below, say, 20 mm. In any but the poorest areas this should provide a fair enough indication of the need of such children for sanatorium or hospital treatment, as opposed to outpatient observation.

London, W.1. RICHARD MEYER.

Obituary

HERBERT EDWARD COUNSELL

M.A. OXFD, F.R.C.S.

Dr. H. E. Counsell, "Doggins" to many generations of Oxford undergraduates, died of pneumonia on May 4 at the age of 83. He had been blind in one eye for twenty years and in both eyes for ten—a tragedy which he persisted in regarding as a minor inconvenience. He learned to use a typewriter when over 70 and already almost blind, and with its aid wrote his only book, *37 The Broad*, which was published in 1943.

The facts of his career are few. Born in Chepstow in 1863, the son of a civil servant in the Inland Revenue Department, he read medicine at Guy's, married a nurse at 23, and, with the conjoint qualification, went into general practice at Liss. General practice in those days meant more surgery than medicine and one of the best stories of this master raconteur was that of his first (and successful) mastoid, done on a child on the kitchen table by the light of his gig lamps, with tools found in the kitchen drawer. In the midst of a busy practice he somehow found time to take the F.R.C.S. There followed his move to Oxford, where he hoped to specialise as a surgeon; but he arrived at an unlucky time, with no vacancies on the Radcliffe staff for years to come. At first he ran a private surgical nursing-home, but the lack of a hospital appointment was bound to tell, and he drifted away from surgery into general practice again. A generation grew up which knew him as a greatly loved physician and observed with a shock of surprise his masterly "come-back" to surgery in the first world war.

Counsell was a part of all that he had met. To be in Oxford but not of it was to him impossible. While carrying on a rapidly growing practice, he became an undergraduate of New College, sat every examination without exemption, and, disdaining a return to a subject he had already studied, read the honour school of modern history and scored a second. Thenceforward, he threw himself into every university activity, but especially the O.U.D.S. He was largely responsible for its revival after the first great war and from then until his second eye failed him he was more than the official prompter; he was the friend and confidant of every member and of every visiting actor and actress. His annual party "after the show" was for many the most important social event of the summer term. There until the dawn actors old and young, with a sprinkling of artists, poets, dramatists, novelists, politicians, and even an occasional doctor, filling every chair and sofa, sitting on tables and the tops of bookcases or squatting on the floor, would ply the now almost forgotten art of talk.

The famous O.U.D.S. parties were not isolated occasions. The door of 37 The Broad was always open and no-one used the bell. One walked in and shouted "Doggins" and waited for the genial shout of welcome from the big room with the wide windows which looked across The Broad to the Old Clarendon Building and the decaying stone emperors before the Sheldonian. He must have gone to that house soon after the old emperors had watched the coming and going there of Zuleika Dobson and the Duke of Dorset, and for many years they were able still to see a succession of famous men and lovely women arriving from the ends of the earth or only from the Banbury Road, and to hear them all enter that house in the same informal way. It was only after his sight was gone that the University pulled down the row of beautiful twisted houses which lay between Blackwell's and Holywell, and cast him out to find his way by touch about a newer and less gracious home.

Counsell liked the human race and about its individuals he formed his own opinions, which, whatever others might say, were usually favourable. His tolerance attracted the censure of the more strait-laced, who were shocked to see that, though his own virtue was exemplary, he preferred the company of publicans and sinners. He was intolerant only of the smug and of Ministry of Health officials. The first he avoided; the second he insulted with subtlety and wit, countering with great skill and infinite enjoyment their attempts to reduce the cost of his panel practice. Nothing was too good for his poorer patients.

He had at one time an enormous practice, but he never had a large income and he died a poor man. Until he took a partner in his later years his finances were always in confusion. He often forgot to send out his accounts and would never send them to patients he greatly liked. "Oh, my dear chap," he would say, "we can't charge him anything. He's such a nice fellow." When he lent money, which was often, he seldom got it back again because he would always forget about it within a few minutes. He was the despair of his accountant.

In person he was short and slim but well proportioned. His face was ruddy and deeply seamed, even in middle age, by laughter rather than by care. His hair was thick and white and worn rather long. He affected strange garbs, cloaks and big hats and buckled shoes. Such things became him well. They became part of the Oxford landscape. He was the most famous Oxford "character" of his day, but it is not for his eccentricities that he will be remembered, but for his generosity and tolerance and unfailing kindness. R. G.

ARTHUR SEWELL WESSON

M.D. LOND., F.R.C.P., F.R.C.S.

Arthur Wesson's death at the age of 41 deprives the young specialty of physical medicine of one of its leading members. He went to University College Hospital from Merchant Taylors, and after qualifying in 1925 he held house-appointments there under Professor Elliott and Mr. Gwynne Williams. Later he became pathologist to the Queen's Hospital, Birmingham, and deputy medical superintendent of the Mile End Hospital, London. In 1928 he took his M.D. and in 1936 his F.R.C.S. The same year he was awarded a Bilton Pollard fellowship and he spent the next few months studying physical medicine in America and in Sweden. Meanwhile U.C.H. had decided to raise the charge of the physical medicine department to the status of an honorary staff appointment, and on his return to England Wesson was chosen of fill the post. Within a few months he had transformed the department so that it soon became a diagnostic as well as a treatment centre. His outpatient clinics were always attended by medical students and it was not uncommon for outside doctors to be present. He was also physician to the department of physical medicine at the Royal Surrey County Hospital at Guildford. To this period belong his published work on postural and occupational factors in rheumatic pain and on manipulation in rheumatic disorders.

In 1940 Wesson joined the R.A.M.C. as a physical medicine specialist, and at the end of 1942 he became adviser in physical medicine to C.M.F. with the rank of lieut.-colonel. His chief interest was in body mechanics and abnormalities of posture, and his knowledge was put to excellent use when he took medical charge of the first Army physical development centre and later of rehabilitation among our forces in North Africa. It was on his return from Italy that he contracted the illness from which he died on May 8 at University College Hospital. But his

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report on his work in that theatre of war will remain as a blue-print for any future campaign.

Essentially a team-worker, Wesson effaced himself to secure the coöperation and coördination of his colleagues, both medical and auxiliary, for he realised that therein lay the key to successful reablement. His cheerfulness and unfailingly happy approach sometimes obscured the scope of his knowledge—he was a fellow of both colleges—but it secured the devotion of the physiotherapists and physical-training instructors whom he delighted to teach, and of his patients who received every ounce of his energy. The concern of his friends of all ages during his illness, and their grief when he died, were testimony to his charm and ability and to their affection.

Public Health

Smallpox

IN the last four weeks there have been 5 cases of smallpox, with 2 deaths, at Rock Ferry (Birkenhead). The source of the infection is unknown. The first case was in a man of 60, who was taken ill on April 23. He infected his daughter of 15, his son of 17, and his wife, aged 38, who has since died of hæmorrhagic smallpox. The fifth case is apparently unconnected with these. A young married woman, taken ill at the same time as the man's wife and children, died of hæmorrhagic smallpox at about the same time as the wife.

Infectious Disease in England and Wales

WEEK ENDED MAY 11

Notifications.—Infectious disease: smallpox, 2 (1 at Plymouth, 1 at Rochester, Kent); scarlet fever, 1022; whooping-cough, 2180; diphtheria, 368; paratyphoid, 1; typhoid, 9; measles (excluding rubella), 2570; pneumonia (primary or influenzal), 445; cerebro-spinal fever, 61; poliomyelitis, 3; polio-encephalitis, 1; encephalitis lethargica, 3; dysentery, 137; puerperal pyrexia, 123; ophthalmia neonatorum, 73. No case of cholera or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on May 8 was 1063. During the previous week the following cases were admitted: scarlet fever, 30; diphtheria, 42; measles, 94; whooping-cough, 27.

Deaths.—In 126 great towns there were no deaths from enteric fever or measles. 1 (0) from scarlet fever, 9 (3) from whooping-cough, 9 (2) from diphtheria, 48 (7) from diarrhœa and enteritis under two years, and 8 (0) from influenza.

The number of stillbirths notified during the week was 276 (corresponding to a rate of 32 per thousand total births), including 38 in London.

Appointments

HEATH, C. M., M.D. Camb., D.O.M.S.: ophthalmic surgeon, Camborne-Redruth Miners' and General Hospital, Redruth.

REEKIE, A. G., M.B. Aberd.: M.O.H., Lanarkshire.

Coventry and Warwickshire Hospital.—The following appointments are announced:

BISHOP, J. W., M.B. Leeds, D.O.M.S.: ophthalmic surgeon.

DUVAL, H. R., M.D. Queen's Univ., Ont., F.R.C.S.E., M.R.C.O.G.: gynæcological surgeon.

GLASGOW, J. E., M.B. Belf., D.M.R.E.: radiologist in charge of X-ray diagnostic services.

KANDER, H. S., F.R.C.S.: ear, nose, and throat surgeon.

NISBET, N. W., F.R.C.S.E.: orthopædic surgeon.

RUSSELL, MARY J. H., M.B. N.Z.: ear, nose, and throat surgeon.

Royal Liverpool United Hospital.—The following appointments are announced:

ADAMS, A. R. D., M.D. Lpool, M.R.C.P., D.T.M.: physician for tropical diseases, Liverpool Royal Infirmary branch.

DATNOW, M. M., M.D. Lpool, F.R.C.S.E., F.R.C.O.G.: gynæcological and obstetrical surgeon, Royal Southern Hospital branch.

HERD, S. B., M.D. Lpool, F.R.C.O.G.: gynæcological and obstetrical surgeon, Liverpool Stanley Hospital branch.

ROBERTS, N. W., M.CH.ORTH. Lpool, M.B. Lond., F.R.C.S.: orthopædic surgeon, Liverpool Royal Infirmary branch.

Salford Royal Hospital.—The following appointments have been announced:

CREER, W. SAYLE, M.CH.ORTH. Lpool, F.R.C.S.: orthopædic surgeon.

HESLOP, T. S., M.B. Manc., F.R.C.S.: surgeon.

NICHOLSON, W. A. B., M.B. Manc., F.R.C.S.: asst. surgeon.

PARKINSON, J. S., M.B. Manc., M.R.C.P.: asst. physician.

RICKARDS, C. E. B., M.B. Manc., M.R.C.O.G.: gynæcologist.

THOMSON, M. L., M.D. Aberd., M.R.C.P.: physician.

WADE, H. J., M.D. Manc., M.R.C.P.: asst. physician.

WILDE, J. F., M.D. Dubl., D.P.M.: asst. psychiatrist.

WYSE, R. W., G.M., M.B. Glasg., F.R.C.S.E.: asst. surgeon.

Medical Diary

MAY 26—JUNE 1

Monday, May 27th

ROYAL SOCIETY OF MEDICINE

7 P.M. *Odontology* (Royal College of Surgeons, Lincoln's Inn Fields, W.C.2.) Sir Frank Colyer: Demonstration of museum specimens.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1

8.30 P.M. Prof. G. W. Pickering, Mr. A. Dickson Wright: Hypertension.

HARVEIAN SOCIETY OF LONDON

5 P.M. (Royal College of Surgeons, Lincoln's Inn Fields, W.C.2.) Air Marshal Sir Harold Whittingham: Progress of Aviation Medicine in the Royal Air Force and its Application to Problems of Civil Aviation. (Harveian lecture.)

Tuesday, 28th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1

5 P.M. *Medicine.* Sir Alexander Fleming, F.R.S., Prof. R. V. Christie: Medical Uses of Penicillin.

EUGENICS SOCIETY

4.45 P.M. (Burlington House, Piccadilly, W.1.) Mr. Geoffrey Eley, Mrs. C. Bosanquet, Dr. Maurice Newfield: Eugenically Desirable Types.

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE

5 P.M. (Royal Infirmary.) Dr. Robert Walmsley: Form and Function.

Wednesday, 29th

ROYAL SOCIETY OF MEDICINE

Comparative Medicine. Demonstration at the Veterinary Laboratory, Ministry of Agriculture, New Haw, Weybridge.

Thursday, 30th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2

5 P.M. Mr. C. G. Rob: Diagnosis of Abdominal Trauma in Warfare. (Hunterian lecture.)

EDINBURGH POSTGRADUATE LECTURES

4.30 P.M. (Royal Infirmary.) Dr. Ernest Bulmer: Gastroscopy—its Present Place in Gastro-enterology. (Honyman Gillespie lecture.)

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

10 A.M. (1, Wimpole Street, London, W.1.) Mr. C. B. Goulden: Johannes Evangelista Purkinje (presidential address). Air Commodore P. C. Livingston and Mr. Harold Ridley: Ocular Disturbances associated with Malnutrition.

2.30 P.M. Short papers.

4 P.M. Dr. Arnold Knapp: Intracapsular Cataract Extraction. (Bowman lecture.)

Friday, 31st

ROYAL SOCIETY OF MEDICINE

2.30 P.M. *Ophthalmology.* Joint clinical meeting with the Ophthalmological Society of the United Kingdom.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

10 A.M. Short papers.

Saturday, June 1st

ROYAL SOCIETY OF MEDICINE

Anæsthetics. Summer meeting in Birmingham.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION

2.30 P.M. (South London Hospital, Clapham Common, S.W.4.) Cases will be shown.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

10 A.M. Short papers.

Births, Marriages, and Deaths

BIRTHS

BRIGDEN.—On May 12, in London, the wife of Major W. W. Brigden, R.A.M.C.—a daughter.

HARVEY.—On May 12, the wife of Dr. William Harvey, of Chorleywood, Herts—a son.

HEARN.—On May 17, at Bedford, the wife of Lieut.-Colonel G. W. Hearn, R.A.M.C.—a daughter.

LENDRUM.—On May 17, in London, the wife of Dr. J. D. Lendrum—a daughter.

MCKELVEY.—On May 2, in Cairo, the wife of Lieut.-Colonel T. P. H. McKelvey, R.A.M.C.—a daughter.

MELROSE.—On May 15, in London, the wife of Dr. D. G. Melrose—a son.

WILDY.—On May 15, at Ipswich, the wife of Lieutenant P. L. Wildy, R.A.M.C.—a son.

YOUNGHUSBAND.—On May 10, at Winchester, the wife of Mr. J. D. Younghusband, F.R.C.S.E.—a son.

MARRIAGES

EWING—PARNALL.—On May 18, at Hendon, Maurice Rossie Ewing, F.R.C.S.E., to Phyllis Edith Parnall.

KEYS—DAY.—On May 11, David Noble Keys, lieut.-colonel R.A.M.C., to Valerie Day.

DEATHS

BLAND.—On May 11, in London, John Oliver Wentworth Bland, M.D. Camb., aged 46.

BRYCE.—On May 16, at Oxford, Thomas Hastie Bryce, M.D. Edin., LL.D. Glasg., F.R.S., aged 83.

COWES.—On April 23, at Buenos Aires, Adam Cowes, M.R.C.S., aged 76.

HODGES.—On May 17, at Bognor Regis, Aubrey Dallas Percival Hodges, C.M.G., M.D. Lond., formerly P.M.O., Uganda Protectorate.

STEPHENS.—On May 17, at Ferryside, Carmarthenshire, John William Watson Stephens, M.D. Camb., F.R.S.

WALKER.—On May 20, Alfred Walker, M.A., M.D. Camb., of Crawley, Sussex, aged 80.

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Notes and News

ENTRY INTO UNIVERSITIES

THE conditions of entry into universities previously announced by the Minister of Labour (*Lancet*, May 11, p. 695) have been amplified by an explanatory note. In the coming academic year first priority for men will be given to the following. (1) Those released from the Forces in class A or discharged on medical grounds. (2) Those employed in work of national importance who, if they had been serving in the Forces, would have been eligible for release in class A. (3) Scholars and young men of promise in release-groups up to 55 who are nominated by the universities for release in class B. (4) Scholars and young men of promise who by Sept. 1 will have completed three years' work of national importance after reaching the age of 18. This period may include both civilian work and service in the Forces, and an application for release under class B will be considered if the candidate is still serving and has completed a year in the Forces. Second priority for men will be given to: (1) scholars and other promising students from schools, born between Oct. 1, 1927, and Sept. 30, 1928; and (2) men in medical grades 3 and 4, other than those who may qualify for first priority. Men in the 1927–28 age-group who are granted deferment will be allowed to complete their university courses, but will afterwards be called up. For women it is suggested that preference should be given on the same basis as for men. It is hoped that women not in the first-priority class will not be admitted when their entry would exclude first-priority men, except where these women show exceptional promise. Final decisions on some applications by young men from schools may not be announced until Sept. 1.

The university correspondent of the *Observer* (May 19) concludes from a survey of the situation in London that applications from ex-Service and other priority students will alone fill most of the places in many faculties; the average young student's prospect of being accepted for a university course straight from school is remoter than ever.

Financial aid for winners of scholarships is promised in a Ministry of Education announcement summarised in Monday's newspapers. Grants will be made to any boy or girl whose parents' income is below £1500 a year if he or she wins an open scholarship or exhibition awarded by a university or university college, or a State scholarship, or a close scholarship or exhibition provided that the Minister is satisfied that its standard is sufficiently high. The grant will not be applicable to winners of scholarships or exhibitions awarded by schools or educational trusts. The Ministry's contribution to State scholarships, of which 360 are awarded annually, will no longer be limited to £100. Under the scheme there will be a full award where the parents' income is below £600 a year; above that income there will be a graduated scale of contribution up to £1500 a year. The extra help will provide for the payment of approved fees and a maintenance allowance sufficient, after taking into account the value of the award already won and the assessed contribution, if any, from the parents, to raise the student's resources to an approved standard figure. The effect of this innovation, whose cost is estimated at £300,000 a year, will be to release local authorities from the task of helping open and State scholars with their scholarship funds, which can now be devoted mainly to providing a university education for those who have not gained a scholarship but are likely to complete with credit a course at a university or elsewhere.

STUDIES OF CHILDHOOD AT OXFORD

THE development of normal children has not yet been thoroughly studied. The welfare centres have collected data about the first year of life, but our knowledge of the child between the ages of one and five is particularly scanty because he is not then regularly supervised by any social agency. In his first annual report, Prof. J. A. Ryle, director of the new Institute of Social Medicine at Oxford, draws fresh attention to this lacuna.[1] One of the first tasks undertaken by the institute has been a study of the preschool-child, the aim being to compare, at three-monthly intervals, the clinical and somatic variations during this period of life in children drawn from all social groups. By last October 320 babies had been enrolled, and 320 first examinations and 458 re-examinations made. Other studies of childhood include examination of the skeletal changes during the early years, as seen radiographically; studies of twins; and a statistical analysis of the stillbirth and neonatal death-rates in the administrative counties and county boroughs of England and Wales in relation to urban and rural conditions, population density, local employment of women, and such other factors as might affect infant life. If preliminary investigations reveal "black spots" scattered over the country, the institute may undertake local surveys. These studies should greatly benefit pædiatrics, for while the norm remains unknown it is impossible either to recognise deviations from it or to judge their significance.

1. Annual Report, 1945. Obtainable from the institute, 10 Parks Road, Oxford.

MEDICAL EDUCATION IN EUROPE

ONE of the marks that the Nazis have left on the countries which they occupied is a shattered university system. Buildings have been destroyed and teachers scattered; libraries have been pillaged, books burned, and the printing of new volumes prevented. The peoples of Europe are applying every resource to overcome these setbacks; but, however great their initiative, their task will be indefinitely delayed without the help of the countries which escaped occupation. In particular, we, though ourselves hard-pressed for paper, can help to lessen the effects of the shortage of books. In at least one country typewritten duplicated sheets are serving as textbooks; and within recent months these columns have contained appeals for books on behalf of three different countries. There is no doubt of the want; and there is now welcome evidence that it is to be met more systematically.

The Royal Society of Medicine, with an assurance of coöperation from Britain's libraries, and aided by a grant from the Rockefeller Foundation, is taking the lead in the restoration of Europe's devastated libraries, and at a meeting in London on May 17, the plan was greeted by representatives of Allied embassies, UNRRA, UNESCO, and the British Council. Reliance must at present be placed largely on microfilms of textbooks and periodicals, but as Mr. G. R. Edwards, the secretary, has explained, these will be sent only when the original books or journals are not obtainable (see *Lancet*, 1945, ii, 856, 861; 1946, i, 35). At last week's meeting Mr. Aneurin Bevan, the Minister of Health, would hazard no estimate when supplies of paper would suffice for the printing of books and journals in the quantities needed.

DISTRIBUTION OF PENICILLIN

THE following notice has been issued by the Ministry of Supply.

As from June 1, the present free issue of penicillin by the Ministry of Supply through the hospital system will cease. From that date penicillin will be available to hospitals, to the medical and dental professions, and to retail pharmacists through trade channels. Supplies should be obtained from the usual suppliers of such products. Penicillin or any preparation containing penicillin may be supplied to the public only against the prescription of a registered medical or dental practitioner. Initially most of the penicillin will be in the form of dried powder packed in vials or ampoules containing 0·1, 0·2, 0·5, and 1·0 mega units. The maximum retail prices of these packs will be 2*s*. 9*d*., 4*s*. 9*d*., 10*s*. 6*d*., and 20*s*. respectively. Penicillin will also be available in an oil-wax suspension for injection. Pharmacists may use dried penicillin in dispensing the prescriptions of registered medical and dental practitioners. As time goes on, increasing quantities of penicillin preparations will become available from the manufacturers. Should any difficulty be experienced in obtaining supplies, advice may be sought from the Ministry of Supply, Penicillin Production Control, Tothill Street, London, S.W.1 (Abbey 7788, ext. 403).

DIPHTHERIA IMMUNISATION: THE MINISTRY'S APPEAL

THE incidence of diphtheria has declined each year since the Government's campaign for immunisation was begun; last year's total of 720 deaths was the lowest ever recorded, and was only about a quarter of the pre-war average. This year the number of cases and deaths has increased, and the Ministry of Health has appealed to local authorities to immunise as many children as possible before the autumn, particularly in view of the condition's prevalence on the Continent. Nearly 6 million children have been immunised in the last five years, but it is known that about 3 million remain unprotected. It is believed that if three-quarters of the child population were immunised diphtheria as an epidemic disease could be defeated.

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THE WEEK'S FILMS

Orthopædic Rehabilitation in the Navy.—This long film (100 min.) was made to demonstrate to all who have care of naval orthopædic patients the methods advocated by the Admiralty's medical branch. Its two parts, showing work at the hospital and at the special centre, illustrate all stages of treatment of the commoner fractures, from reception of the injured man to his return to the job he was doing. Technically this production is open to criticism. Vision is subjugated to sound, and the monotony of the commentary is only slightly relieved by a change of voices. The illustrations of plasters, moving limbs, and gymnastic exercises lack visual continuity, and the confusion is aggravated by the frequent reappearance of previous shots in fresh contexts. The presentation is the unhappier for the use of a few tricks of photography which are employed again and again in an attempt to introduce freshness. The material should benefit by being broken into self-contained sections, with occasional captions to underline important points; and different versions might be made for the various classes of medical personnel.

It's Up to You describes to the naval orthopædic patient the measures that are being taken for his treatment and the purpose of the rehabilitation centre he is about to enter. In simple terms it tells why a joint becomes stiff from disuse, how exercises can help to prevent this stiffness, and why full active coöperation is required of the patient to bring about his recovery. Although at times confusing, this film, which runs for 16 minutes, is useful, and would be suitable also for civilian patients.

Eight Disney health education films, made under the auspices of the Office of Inter-American Affairs to teach the elements of health to primitive peoples, will be shown at the Gaumont British Film Theatre, 142, Wardour Street, London, W.1, on May 28 at 6 P.M. to a meeting of the colour and medical groups of the Royal Photographic Society.

University of Cambridge

On May 18 the following degrees were conferred:

M.D.—*H. E. W. Roberton, *D. A. Smith, E. V. Bevan, S. R. F. Whittaker, J. D. Fergusson, Derek Russell-Davis, N. C. Oswald, and J. S. Minett.

M.B., B.Chir.—*S. R. Mawson, *A. L. T. Easton, *W. H. Davies, *R. I. Milne, and *N. K. Dryden.

*By proxy.

University of London

Sir Ernest Graham-Little, M.P., has been re-elected for the eleventh consecutive time to represent medical graduates of convocation upon the senate.

Royal College of Surgeons of England

Mr. Charles L. Mayer, of New York, has made a gift to the college of £1000 as a prize for Prof. E. C. Dodds, F.R.S., in recognition of his work in discovering and studying stilbœstrol, and as an encouragement to him to continue his researches in the synthesis of hormones. The award will be made to Professor Dodds at the meeting of the council on June 13. A few months ago Mr. Mayer gave the college a similar prize for Mr. Terence Millin.

Royal College of Physicians of Edinburgh

At a quarterly meeting of the college on May 7, with Dr. D. M. Lyon, the president, in the chair, Dr. T. Carlyle Mitchell (Radlett) and Dr. Oscar Olbrich (Edinburgh) were introduced and took their seats as fellows. Dr. A. H. Campbell (Redhill), Dr. N. G. Pandalai (Vizagapatam, India), Dr. N. F. Lilauwala (Bombay), Dr. Gordon O. Horne (Edinburgh), and Dr. Stanley G. Graham (Glasgow) were elected to the fellowship.

Royal College of Surgeons of Edinburgh

At a meeting of the college on May 16, with Mr. James M. Graham, the president, in the chair, the following were admitted to the fellowship:

H. M. Bradmore, M.B. Edin.; Aziz El-Masri, M.B. Cairo; A. A. Finlayson, M.B. St. And.; A. L. Goodall, M.D. Glasg.; R. S. Hunt, M.R.C.S.; R. R. Hunter, M.B. Camb.; W. C. Lawrence, M.B. Lond.; Barney Lawson, M.R.C.S.; K. M. Leitch, M.B. Edin.; D. M. N. Longridge, M.R.C.S.; I. W. J. McAdam, M.B. Edin.; William Magauran, M.B. Glasg.; K. S. Masalawala, M.B. Bombay; N. R. K. Mitchell, M.B. Edin.; Mary G. Murphy, M.B. Lond.; L. R. Rabson, M.D. Man.; D. R. Ryder, M.B. N.Z.; R. S. Stewart, M.B. N.Z.; and E. B. Tovee, M.D. Toronto.

The Henry Arthur Dalziel Ferns bursary, after a competitive examination on the application of organic chemistry to medicine, was awarded to Mr. Ian S. Trotter.

Ophthalmological Society of the United Kingdom

The society is holding its annual congress from May 30 to June 1 at 1, Wimpole Street, London, W.1. Further details will be found in the Medical Diary. The dinner in connexion with the congress will take place at 7.30 P.M., on Thursday, May 30, at the Royal College of Surgeons, Lincoln's Inn Fields, W.C.2. Further particulars may be had from Mr. Frank Law, the hon. secretary, 36, Devonshire Place, W.1.

Lectures in France on Penicillin

Mr. E. B. Chain, PH.D., is leaving for Paris on May 28 to lecture on penicillin at the Palais de la Découverte in the series by British scientists arranged with the help of the British Council. He will also lecture on the Chemistry of Penicillin to the French Biochemical Society.

Royal Society of Arts

The Albert gold medal of the Royal Society of Arts has been conferred this year on Sir Alexander Fleming, F.R.S., and Sir Howard Florey, F.R.S., as a joint award for their services in the discovery and development of penicillin.

Institute of Public Administration

Dr. H. E. Martin, hon. secretary of the Blackpool medical and panel committees, and a temporary principal medical officer of the Ministry of Pensions, has been awarded the Haldane prize for an essay on the Transition to a State Medical Service.

University of Sheffield

Prof. G. A. Clark has resigned from the chair of physiology to take up a post at the Ministry of Health.

Oxford Meeting

The chemistry of antibacterial substances will be discussed by the Chemical Society and the University of Oxford Alembic Club at a joint meeting which is to be held at the Physical Chemistry Laboratory, South Parks Road, Oxford, on June 6, at 2 P.M. Papers will be read by Sir Robert Robinson, P.R.S. (Structural Problems in the Chemistry of Antibacterial Substances); Mr. J. M. G. Pryce and Prof. C. N. Hinshelwood, SC.D., F.R.S. (Physical Chemical Aspects of Antibacterial Action); Mr. D. D. Woods, PH.D. (Antibacterial Agents in Relation to Bacterial Metabolism); and Mr. E. B. Chain, PH.D.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. G. T. WILLOUGHBY CASHELL, F.R.C.S.E., Aubrey House, 27, Bath Road, Reading.
Mr. A. G. CROSS, F.R.C.S., 27, Harley Street, W.1 (Langham 3614).
Mr. GEORGE Y. FEGGETTER, M.S., F.R.C.S., Silksworth, Fernwood Road, Newcastle-on-Tyne, 2.
Dr. B. C. NICHOLSON, Archway House, 24, Swan Road, Harrogate, Yorks.
Dr. PAUL H. WOOD, F.R.C.P., 86, Brook Street, W.1 (Mayfair 5001).

Dutch Scientists' Visit

A delegation of Dutch scientists now visiting this country under the auspices of the British Council includes Prof. M. van Eekelen, director of the Central Institute for Nutrition Research, Prof. B. C. P. Jansen, director of the Netherlands Institute of Nutrition, Prof. H. G. K. Westenbrink, who holds the chair of physiological chemistry at the University of Utrecht, and Dr. W. M. Wassink, director of the Institute for Cancer Research, Amsterdam. The party began a tour of the provinces and Scotland on May 17.

Association of Medical Officers (Middlesex)

This association, which is representative of medical officers employed whole-time by the Middlesex County Council, has adopted a resolution welcoming the general principles outlined in the National Health Service Bill but suggesting the following modifications:

(*a*) Machinery should be devised for ensuring a greater control of the national hospital service by elected representatives of the public.
(*b*) The pay-bed system in hospitals should terminate altogether: patients should receive extra privacy, &c., solely on medical grounds. There should be a hospital building policy that will ensure a far higher proportion of single-bedded wards than formerly.
(*c*) That in view of the influence of the university medical faculties in the future, these should be staffed chiefly by whole-time members, as is the case in other university faculties.

VITAMIN CHART, 1946.—Crookes Laboratories (Park Royal, London, N.W.10) have compiled an up-to-date wall chart which summarises in tabular form what is known about the vitamins. Copies will be supplied free to doctors, chemists, hospitals, and schools.

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PENICILLIN AND THE GENERAL PRACTITIONER*

G. B. MITCHELL-HEGGS
O.B.E., M.D. Lond., F.R.C.P.
PHYSICIAN IN CHARGE OF THE SKIN DEPARTMENT, ST. MARY'S HOSPITAL, LONDON

THE doctor in general practice should remember at all times that the essential principle in penicillin therapy is to bring the optimum concentration of penicillin into regular contact with organisms which are sensitive to it. Penicillin therapy does not replace the principles and practice of good treatment in medicine, surgery, or the specialties.

Greatest success will be obtained in treating those cases where the predominant infection is penicillin-sensitive. It is obvious, therefore, that the organism responsible for the infection should undergo bacteriological examination. In practice this means that "sterile" specimens of blood, sputum, or pus should be taken as soon as the practitioner realises that a severe acute or chronic infection has occurred. This investigation need not necessarily be followed by penicillin therapy—the patient's immunity may be sufficient to overcome the infection, and the correct treatment may be surgery or less specific chemotherapy.

It must be borne in mind that systemic and local penicillin therapy demand a fair chance. This means a course of treatment lasting several days, entailing considerable extra nursing and medical attention. It will often be a trial rather than a pleasure to the patient and it is best for him to realise that it may cause pain. Brands of penicillin vary, however, in their tendency to produce pain. This is probably attributable to associated substances rather than to the penicillin. Immediately after the injection one experiences a sharp stinging pain which passes off in a few seconds. A dull ache may remain for half an hour and the site may be tender for 24 hours. Only those who have had penicillin injections every 3 hours for 7 or more days can realise how the loss of rest is followed by a dread of the next injection, however painless, however deftly given. Penicillin treatment, then, is a strain to patient, nurse, and medical attendant.

Bacteriological diagnosis of an infection should be the practitioner's aim, but it is not obligatory. He must realise that this maxim is for his guidance, not bondage.

In cases where the invading infection is penicillin-sensitive, speedy adequate dosage will give the best result. In fact it can well be compared with intravenous quinine in malignant malaria, antitoxin in diphtheria, sulphaguanidine in bacillary dysentery, or sulphapyridine in meningococcal meningitis. In these every hour of delay in treatment lowers the patient's resistance and may hasten his end. The sequelæ and adverse effects of penicillin therapy are minimal in comparison with other methods of treatment.

Once bacteriological examination has shown that the organism is penicillin-sensitive or likely to be so, it is often better to stop other treatment and see how the patient fares with penicillin therapy. This applies particularly to local treatment. Soap and water and saline are the least detrimental to success, and antiseptics, especially solutions of the heavy metals and hydrogen peroxide, iodine, &c., should not be used. Sulphathiazole, however, can be mixed with penicillin powder without detriment to the latter. Never forget that penicillin dusting powder for insufflation, mixed with sulphathiazole, is dangerous if applied to the skin for more than 5 days. Hypersensitivity to the sulphonamides has developed in many cases.

A busy practitioner may find it necessary under adverse conditions to paint the site of aspiration or penicillin injection with iodine or spirit. The danger of carrying much iodine into the skin is small in relation to the possible benefit of early treatment in such conditions.

Many of the early recipients of penicillin were Service personnel, and local anæsthesia was only occasionally used. This is necessary only if the needle is to be kept in for several hours, as in the continuous drip method. It is better, however, to give the painless injection of procaine followed by penicillin from the same syringe, as indicated in the advice on intramuscular administration.

METHODS OF ADMINISTRATION

Penicillin can be administered by intravenous, intramuscular, or subcutaneous injections to obtain a systemic effect. In addition it can be injected into the cavities of joints, the theca spinalis, pleural cavities, pericardium, or the centre of an abscess or infected cyst. In the case of the peritoneal cavity, the bottom of a deep wound, or the vagina, intubation therapy is used.

When injection is to be given into any infected cavity it is essential to ensure that there is adequate removal of pus or drainage of the potential space. Little good can be expected from injections of penicillin into a hæmothorax or pyothorax which has been neither drained nor aspirated.

It is important to remember that penicillin helps to fight infection not only by killing sensitive organisms but by diminishing their reproduction and spread. The maxims of Hilton, implying that painful and infected parts must be rested, are most important if penicillin therapy is to give its best results.

Equipment for a Local Injection.—The apparatus required is as follows:

(1) A 5 millilitre and a 2 millilitre syringe.
(2) Box of 5-8 cm. needles.
(3) Box of ampoules of penicillin powder.
(4) Bottle or ampoule of sterile water.
(5) Box of files.
(6) Two pairs of dissection forceps.
(7) Soap and a bottle of surgical spirit.
(8) Cotton-wool and lint.
(9) Lint "purse-string" bag.
(10) Saucepan to be used as a steriliser.
(11) 2% procaine in ampoule or bottle without adrenaline.

Method of Sterilising Instruments.—Take the syringe to pieces, wrap each part separately in a small piece of lint, and place them in the lint bag together with two needles and two pairs of dissection forceps. Place the bag in a saucepan half filled with cold water, leaving the strings out of the water. Bring the water to the boil and allow to boil for a further 5 minutes. Lift the lint bag out of the water, allow it to drain, and place it on a clean plate. Take out the dissection forceps and prepare the syringe under aseptic conditions.

Preparation of Site for Injection.—While the syringe is being sterilised, the site selected for the injection may be washed with soap and water. Surgical spirit may also be used should the skin need extra cleansing, but antiseptics generally should be avoided. The usual areas selected for this type of injection are as follows:

Thigh.—Over the greater trochanter, where there is a lymph space, or the vastus lateralis muscle, which does not cover any vital structure.

Buttock.—Upper outer quadrant of the gluteal muscles, along a line joining the top of the natal cleft and top of the greater trochanter.

Shoulder.—The deltoid or triceps muscles.

It is a good plan to choose six sites, telling the patient their order of selection so that he can indicate the proper region for the next injection. In patients with

* A chapter from *Penicillin and its Practical Application*, edited by Sir Alexander Fleming, F.R.S., to be published early in July by Butterworth and Co. (Publishers) Ltd., Bell Yard, London, W.C.2, price 30*s.*

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multiple injuries or burns, or in those who should not be moved, the choice will be much more limited. A good routine is: left shoulder, left hip, left buttock, right shoulder, right hip, and right buttock. The patient will thus not have both sides simultaneously in a painful and tender state.

Method of Injection.—Penicillin is for the most part issued in rubber-capped bottles and the rubber is covered with a removable disk. The metal disk is removed and enough sterile physiological saline is introduced with the syringe. The penicillin rapidly dissolves and sufficient for one dose is withdrawn into the syringe (the amount of penicillin solution should be 1 ml. for each injection), followed by 0·5–1 ml. of 2% procaine. Plunge the needle into the selected area and slowly inject without mixing anæsthetic and penicillin solution further. The local anæsthetic thus precedes the solution of penicillin.

Cleaning and Storage.—Wash instruments and all parts of the syringe under running water and dry thoroughly. Collect all the equipment and place on a tray in a safe place ready for the next injection.

Frequency of Injections and Duration of Course.—It is sometimes said by general practitioners that systemic penicillin treatment is too complicated for them in that it involves a multiplicity of injections. The common practice of giving 15,000 or 20,000 units every 3 hours day and night is hardly possible in general practice unless the patient has a special nurse, nor is the modification whereby the injections during the night are replaced by one large dose at bed-time. Fortunately, however, in most cases the infection responds to less frequent injections, and very satisfactory results have been obtained in ambulatory cases with a single dose of 300,000 units or twice daily doses of, say, 100,000 units. When the oil-wax or similar "depot" preparations are perfected, injections given once or twice a day may well become universal, but even with watery solutions excellent results can be obtained with such dosage in most infections. It is, however, less economical in penicillin than 3-hourly dosage and the doses indicated above are about the minimum. It is useless to give small doses such as 15,000 units once or twice daily. The duration of a course of systemic penicillin will depend on the nature of the infection. It is far better to continue the administration for a few days too long than to cut the course short and risk a relapse.

Complications in Systemic Administration.—These are rare. On the contrary, the symptoms of injection—headache, anorexia, and lassitude—are diminished with the first injections. Once penicillin therapy is begun the pain tends to lessen. Patients who complain of pain at the site of injection more than 24 hours later should be examined for a tender red swelling since the possibility is that an organism insensitive to penicillin has been introduced with the injection. Appropriate conservative local measures, such as a hot fomentation, kaolin poultice, and radiant heat, may then be sufficient, but even chemotherapy or surgery may be required. Urticaria and angioneurotic œdema may occur, but they do not necessitate stoppage of the injections as the eruption can often be controlled by ephedrine, a dose of gr. $^1/_2$ thrice daily for several days being usually adequate for adults. Symptoms similar to serum sickness—malaise and joint pains with fever—have been recorded but are extremely rare.

PENICILLIN THERAPY COMBINED WITH SURGICAL MEASURES

When a doctor decides that incision of an abscess is necessary it is a good plan to aid the natural general immunities with the localising effect of conservative measures such as rest and moist or dry heat. An additional aim is to establish a penicillin screen. Systemic penicillin should be administered for 24 hours before any other measures are undertaken which may result in spread of infection. Penicillin will thus diminish the risk of septicæmia or pyæmia.

When osteomyelitis or a perinephric abscess is suspected, it is correct to start penicillin treatment at once, provided that arrangements are also made for early specialist surgery. Apparent early cure is frequently followed by relapse. Chronic osteomyelitis is most resistant to massive doses of penicillin and always necessitates surgery. Perinephric abscess may remain discrete or loculated; the fever may fall but not disappear. A blood-count will show a fall in the polymorphonuclear leucocytes and a rise in the lymphocytes, but if the penicillin therapy is stopped for 24 hours all the symptoms and signs will recur.

LOCAL TREATMENT

The preparations of penicillin for local application are constantly increasing in variety, number, and scope. Those available now are listed below.

It is desirable for preparations containing penicillin to include a substance which is bactericidal to gram-negative organisms, especially if the preparation is liable to be contaminated, because the majority of gram-negative organisms secrete a penicillinase which tends to inactivate penicillin.

In practice a doctor can arrange for a spray or lotion to be prepared once daily or even once weekly if stored in a cool place. The penicillin may then be used at certain times in his surgery or during the course of a visiting round either by himself or a nurse. Penicillin cream will remain effective for as long as a month. The containers of spray lotions and creams should be sterilised by boiling before they are filled, and when in use the cream may be removed from the pot with a sterilised teaspoon.

Penicillin has been prepared for local use in the following preparations:

Lozenges	Solution for sprays and drops
Suppositories	Cream
Snuff and powder	Ointment

Administration of Penicillin by Inhalation.—When a solution of penicillin in a very fine mist is inhaled the extremely small particles are carried far into the bronchial tree. There are certain methods of producing a vapour of penicillin solution which can be used in infections of the respiratory tract.

The personal factor is so great in successful inhalation therapy that the patient must be taught correct breathing methods. At St. Mary's Hospital the routine is to instruct the patient to take a deep breath, breathe this air right out, hold the breath, and squeeze the bulb four or five times while taking a deep breath.

The solutions used contain 15,000 to 30,000 units of penicillin per ml. The inhaled penicillin is absorbed into the blood-stream, thus combining local and systemic treatment. This method can be used in bronchitis and in bronchiectasis to obtain a therapeutic concentration in the affected areas. The effect on spasm is small, unless an antispasmodic such as ephedrine is combined with this treatment. Inhalations containing mixtures of penicillin solution and antispasmodics are beneficial.

Penicillin Tent.—This is used in the method of combining oxygen or carbon dioxide and oxygen with penicillin vapour. The oxygen is led from a cylinder into a hand type of inhaler and thence into a tent.

COMMON DISEASES IN GENERAL PRACTICE

The list of conditions which are amenable to penicillin therapy is still expanding. In general practice it is not wise to experiment with penicillin therapy, but to reserve it for conditions which are known to respond. Infections by organisms which are penicillin-insensitive must be treated *secundum artem*. Penicillin, for example,

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is of little use in pyelitis or in cholecystitis where the infection is usually caused by *Bacterium coli*.

The following are conditions which are likely to be met in general practice and are amenable to penicillin therapy.

Rhinitis.—Inhalation of snuff and spray shortens the duration and diminishes complications in acute rhinitis. A considerable number of cases of chronic catarrh are relieved by penicillin inhalation.

Acute and Chronic Sinusitis.—These conditions respond only when the spray can pass into the antra or sinuses.

Tonsillitis.—Acute tonsillitis will be only slightly relieved by spray but greatly influenced by systemic penicillin therapy, especially when there is considerable cervical adenitis. In chronic recurrent tonsillitis surgery will probably be essential.

Acute and Chronic Pharyngitis.—These conditions are so often streptococcal that penicillin sprays are justified, but severe cases necessitate systemic penicillin therapy. Lozenges are of use in tonsillitis, pharyngitis, and stomatitis, but unfortunately cases of glossitis have been reported after their administration.

Quinsy.—The lesion responds to systemic penicillin therapy if treated in the early stages, but after pus formation surgery is usually essential.

Acute Recurrent Bronchitis and Chronic Bronchitis.—These conditions are benefited by inhalation therapy if the infecting organism is penicillin-sensitive.

Lobar Pneumonia and Bronchopneumonia.—If due to a penicillin-sensitive organism these conditions respond well to systemic penicillin therapy. A useful dosage is 15,000 units 3-hourly for an early case in an adult. Late cases should have an initial large dose of 60,000 to 100,000 units and then the 15,000 units 3-hourly. The dosage for children depends upon their age and size. A good working guide is 1000 units for each year of age given 3-hourly. Where it is impracticable to give frequent injections the dose may be increased.

Bronchiectasis.—It is particularly important to ensure good drainage of the cavities and the evacuation of the purulent sputum throughout the penicillin inhalation therapy. Peribronchiectatic pneumonia responds to systemic penicillin therapy. Such cases should be placed under specialised observation as soon as possible.

Pleural Effusion and Empyema.—These require very careful investigation before institution of any penicillin therapy.

Vincent's Angina.—This responds quickly to systemic and local therapy, but relapses are common. Penicillin lozenges are also used. Penicillin packs—made from dental wool and penicillin cream, packed round the teeth—have produced excellent results at St. Mary's Hospital. Skilled dental investigation and treatment are essential.

Stomatitis.—When due to penicillin-sensitive organisms, this condition responds to the use of lozenges. Monilia infections (thrush) will not improve.

Genito-urinary Infections.—The conditions which respond to systemic therapy include acute pyelitis if the organism is penicillin-sensitive. After recovery radiological investigation will be necessary to exclude calculi. Usually the infection is due to *Bact. coli* and no response is obtained.

Urethritis.—Gonococcal infection responds in a dramatic manner to systemic penicillin. Such cases must be followed up and have a serological examination at the end of the second and fourth months.

Otitis Media.—In early stages, with red tympanum, large doses such as 100,000 units *statim* and 15,000 units 3-hourly are often successful. If the drum has perforated it is a good plan to add penicillin powder insufflation or drop instillation to the systemic penicillin therapy. If seen in the early stages a suspected mastoid infection should have penicillin, but must still be referred for surgical opinion.

Conjunctivitis.—When due to a penicillin-sensitive organism, this condition responds well to penicillin drops.

Ophthalmia neonatorum usually responds quickly to instillations.

Whitlow.—Penicillin must be given at once if there is thought to be a thecal whitlow. A spreading hæmolytic streptococcal infection with the dangerous red streak of lymphangitis and severe pain at the site of lymph-gland involvement in the elbow and axilla, accompanied by headache, sickness, and high fever, demands immediate treatment with penicillin to ward off death.

Other Diseases.—In general, cases of iritis, corneal ulcer, and hypopyon should be referred to an oculist before treatment is instituted. In corneal abrasions following removal of a foreign body penicillin drops are a good prophylactic measure.

Penicillin spray and cream are extremely useful in impetigo, infected dermatitis, sycosis barbæ, and folliculitis. Systemic therapy is useful in furunculosis, carbuncles, hidradenitis suppurativa axillaris, anthrax, and erysipelas.

Indolent, static, varicose, and traumatic ulcers become cleaner and healthier after the use of penicillin cream. Such treatment can be combined with a glycerin-ichthyol-gelatin dressing after a thorough cleansing and the bandage may be left on for 6 weeks to give good results.

Dramatic results follow the use of penicillin cream in pemphigus neonatorum but systemic therapy is indicated in severe cases.

The general practitioner must realise that penicillin will not cure or improve all types of infection, and may even mask the pathological process, in particular when gonorrhœa and syphilis are being treated, as the infection may be mixed. This limitation also applies to osteomyelitis, early lung abscess, pleurisy, and infections of the uterine tubes. In cases such as these pus may form and surgery may become essential.

AN EPIDEMIC OF INFLUENZA B IN AUSTRALIA *

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J. D. STONE
M.Sc. Melb.

S. G. ANDERSON
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From the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne

EPIDEMICS of influenza B are rare. Retrospective evidence allowed the identification of an epidemic in California in 1936 as influenza B (Francis 1937, 1941). A second widespread epidemic involved the eastern states of the U.S.A. in March, 1940, and from this the standard strain Lee was isolated (Francis 1940). There have been no other reports of extensive influenza epidemics due to this type of virus, though information received through official channels indicates that the virus was active in certain Pacific islands in May and June, 1945.

In Australia there are no records of any epidemic known to be due to influenza B. In Melbourne epidemics o influenza A were experienced in July, 1935 (Burnet 1935), July, 1939 (Burnet and Lush 1939), and May, 1942 (Burnet et al. 1942). Between December, 1941, and January, 1942, there was a sharp and extensive outbreak of "influenza" among civilians and Service personnel. Unfortunately it was impossible to undertake an adequate investigation of this outbreak for reasons which its date will suggest. Three samples of serum in the acute and convalescent stages from patients who appeared to be typical cases of the epidemic showed no antibody rise against either A or B virus. It must remain a possibility that this epidemic was predominantly of B type. The possibility that A predominated is almost ruled out by the occurrence of a typical A epidemic four or five months later (Burnet et al. 1942).

Apart from this possibility B-type infections have occurred only sporadically in our experience. Retrospective serological diagnosis established that a member of the laboratory staff had been infected in 1938, and in 1943 one strain was isolated and serological evidence of about a dozen other infections was obtained. A survey of children's sera made by Beveridge and Burnet (1944) in 1943–44 showed that the proportion with detectable antibody against influenza B (Lee) increased more slowly

* This work was carried out under a grant from the National Health and Medical Research Council of Australia.

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with age than the proportion with A antibody, but that by twelve years of age nearly all possessed significant amounts. These facts make it probable that influenza B in Australia is endemic, occurring sporadically and probably producing a considerable proportion of subclinical infections.

Early in October, 1945, the existence of an influenza epidemic in Victoria was brought to our notice by the occurrence of several cases among the nursing staff of the Royal Melbourne Hospital and by reports of a high incidence in two boarding-schools in Geelong. Our investigations were concentrated on cases among the medical or nursing staff of the hospital and on an outbreak in a Melbourne boarding-school for boys. We have also made fairly extensive inquiries about the prevalence of "influenza" in various groups throughout Victoria.

EXTENT AND CLINICAL CHARACTER OF EPIDEMIC

Since influenza is not notifiable, we have been able to obtain only unsystematic information about the extent of the epidemic. In Melbourne there were relatively few cases among adults, and there was no public recognition of the existence of an influenza epidemic. The Commonwealth Medical Officer in Melbourne, Dr. F. R. Kerr, who is responsible for the medical supervision of many Commonwealth employees, has informed us that there was no significant increase of influenza-like infections in this group over the period. Among Army units stationed in Victoria there was also no rise in the numbers admitted to hospital with respiratory infections.

In many country districts of Victoria there was, however, an unusual prevalence of relatively severe influenza during one or more of the months, September, October, and November, 1945.

Municipalities and shires in which the medical officers of health have specifically referred to unusually active influenza in this period are, in the south-western area, Geelong and suburbs, Queenscliff, South Barwon, Colac, Hampden, Wannon, Winchelsea, and Barrabool.

From a school situated near Geelong (see below) 3 typical cases were shown serologically to have been infected with influenza virus B, and it is therefore reasonable to ascribe the widespread infection in country centres in this general district to the same epidemic.

Influenza has also been mentioned in reports for September and October from Nagambie, Tatura, Wodonga, and Yea in the north-eastern district and from Bendigo, Wycheproof, and Mildura in the north-western.

Inquiries about the position in other states produced no information beyond statements that there was some influenza in New South Wales and South Australia but nothing to suggest an epidemic. During November there was an epidemic of "influenza" in Alice Springs, Central Australia, and at one of the mission stations for aborigines in that district 5 natives died of pneumonia after influenza. Efforts to obtain material from this outbreak were unsuccessful.

ISOLATION OF VIRUS

The method used was that described by Burnet and Stone (1944) involving the inoculation of unsterilised throat washings into the amniotic cavity of 13-day chick embryos, penicillin and sodium sulphamerazine or sodium sulphadiazine being added to prevent or control bacterial infection. In the absence of clinical influenza this method was developed by the use of "mock-up" throat washings to which O-phase virus was added. It proved, however, highly satisfactory with clinical material, and when it was possible to obtain washings at the onset of fever and symptoms a high proportion of positive results was obtained.

Influenza-B virus develops a little more slowly than most A strains, and as a routine eggs were opened five days after inoculation with throat washings. With only 3 exceptions positive results—i.e., specific agglutination of red cells by amniotic fluid—were obtained without further passage. When negative results were obtained, all bacteriologically sterile fluids were pooled and the mixture subinoculated into 6 or 8 further embryos. No evidence of virus was obtained in 8 instances. Case 6, subsequently shown to have an antibody rise against B, gave only one surviving embryo at five days. Passage from this fluid gave 3 of 5 surviving embryos with positive fluids, virus being shown to be of type B. A similar finding was obtained in another serologically proved B case (case 21) which gave 3 negative fluids from surviving embryos inoculated with throat washings. Passage gave one positive fluid from which a typical B strain was identified. One other instance in which negative fluids from embryos given a primary inoculum induced infection on passage is described below in connexion with the fatal case (case 3).

The only disadvantage of the technique is the considerable non-specific mortality of embryos, which made it advisable to use 8 eggs for each washing tested. Over the whole series of 39 primary washings tested 43% of the 330 embryos used died before the fifth day. Several attempts were made to rely on penicillin alone for bacteriostasis, but contaminations were always higher than when a soluble sulphonamide was used in addition. In the course of the work swabs from infants with respiratory infection were tested. Most of these attempts were unsuccessful owing to the growth of coliform organisms and early death of the embryos. From the fluid expressed from a throat swab of a child aged 15 months (case 19) with "bronchiolitis" influenza virus B was isolated in each of the 3 surviving eggs. It is therefore highly desirable that a suitable bacteriostatic active against coliform organisms but not against influenza viruses should be found to deal with this group of cases.

TABLE I—SUMMARY OF RESULTS OF ATTEMPTED ISOLATION OF VIRUS FROM THROAT WASHINGS OF PATIENTS WITH INFLUENZA B (PROVED EITHER BY VIRUS ISOLATION OR BY SUBSEQUENT SEROLOGICAL TEST)

Case no.	Primary inoculation *	Passage †	Initial F/G ratios ‡		Antibody changes Lee B
			Amniotic fluid	Lung	
1	1/4 B	..	10/25	..	<10–110
2	3/8 B	..	45/120	75/140	15– 60
3	1/7 1/5 B	2/2 B	200/140	200/300	P.M.
4	4/5 B	..	40/20	80/160	15–300
5	4/5 B	..	160/80	10/30	20–120
6	0/1	3/5 B	70/60	..	60–400
Pool I	3/5 B	..	..	..	B+
Pool III	1/7 B	..	Not tested	..	B+
7	0/5	0/2	..	..	15– 70
8	0/5 0/5	0/3	..	..	60–280
9	6/7 B	..	80/80	70/160	<10– 70
10	0/7 0/6	0/4	..	..	<10–220
11	1/4 B	..	15/40	..	15– 60
12	0/4	0/3	..	..	15–200
13	0/6	0/4	..	..	15– 80
14	0/7	0/5	..	..	30–240
15	0/3 1/3 B	0/6	100/80	60/100	<10– 40
16	0/7 0/4	0/3	..	..	15– 40
17	0/3	0/4	..	..	<10– 35
18	5/5 B	..	40/80	..	18–140
19	3/3 B	..	160/120	..	Not tested
20	3/5 2/3 B	..	160/160	15/50	15– 50
21	0/3	1/4 B	15/10	..	10–280

* Under "primary inoculation" the number of embryos giving influenza virus detectable by haemagglutination is shown over the number of inoculated embryos which survived 5 days.

† Under "passage" are shown the results of subinoculation of pooled negative amniotic fluids from embryos inoculated with original human material.

‡ F/G ratios: comparative haemagglutinin titres against fowl and guineapig cells of representative first positive passage material, either amniotic fluid or lung emulsion.

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TABLE II—ANTIBODY RISES OBSERVED WITH SERA FROM PATIENTS WITH INFLUENZA B

Extent of rise	Lee B	Case 1 B	Melbourne A
> 32 fold ..	2	1 (1)	1*
16–31 ,, ..	4 (3)	5 (1)	..
8–15 ,, ..	10 (2)	9 (2)	..
4– 7 ,, ..	15 (4)	13 (4)	..
2– 3·5 ,, ..	7 (1)	9 (1)	6
< 2 ,, ..	1	2 (1)	31

Where initial titre was <10, this is taken as 5 in calculating the increase. Cases with <2 fold rise showed a rise greater than this with the other B virus used.
* Case 22 with two attacks, almost certainly consecutive B and A infections, between times when first and second serum samples were obtained.
Numerals in parentheses indicate number of cases from which virus was isolated.

The results of attempted isolation by this method are shown in table I.

SEROLOGICAL FINDINGS

Tests were made, by the hæmagglutination technique previously used in this laboratory, on 66 acute and convalescent serum samples from persons suspected of influenza during October and November, 1945. As a routine tests were made against Melbourne A, Lee B, and the first B strain (case 1) isolated from the present epidemic. The great majority of the sera tested from influenza-B cases showed significant rises with both B strains. Table II shows the rises in the titre given by 38 serum pairs against B (Lee) and A (Melbourne) influenza viruses. This group includes all those which were regarded as influenza-B infections. In table III 6 cases regarded as influenza A are similarly shown. In accordance with the rule now generally adopted a reproducible twofold increase in antibody is regarded as indicating infection.

CASES IN MEDICAL AND NURSING STAFFS OF THE ROYAL MELBOURNE HOSPITAL

Between the beginning of October and Nov. 16 there were 15 cases of clinical influenza among members of the resident medical and nursing staffs of the Royal Melbourne Hospital. Blood samples were obtained from all of these except 2 cases on Oct. 2 and 4. Attempts to isolate virus from throat washings were made in about half the cases. In addition, samples of blood, and in some cases throat washings, were obtained from a number of patients with fever which could subsequently be ascribed to causes other than influenza. Four strains of influenza-B virus and one of influenza A were isolated, all from clinically typical cases.

Altogether 12 persons showed a definite antibody rise to influenza B by agglutination tests. Only one of these did not show a typical influenzal illness; she had a severe head cold with maximal temperature only 99·6° F and made a rapid recovery. Of those who showed no antibody rise only one appeared to be clinically similar to the proved influenza-B cases. The non-influenzal cases of which we have records comprised 2 cases of streptococcal pharyngitis, one of measles, a severe acute sinusitis febrile for two weeks, a transient recurrent attack of sinusitis, and an acute infection not diagnosed that gave a swinging temperature for eight days.

The case of influenza A was clinically typical, and virus was isolated from all of the 7 embryos that survived inoculation for five days. The serological response was very weak, no difference being found between the acute and a 9-day convalescent serum sample. A third sample taken a week later showed a slight increase, the figures given being 30–30–55 against Melbourne A. There was no rise of influenza-B antibody. This case is of interest because, despite the fact that virus was isolated with ease from the throat washings, the antibody response would be regarded as negative, even if the titre of the third sample was used, in any purely serological investigation. Further study of these serum samples will be made when the homologous strain has been suitably adapted.

Only one patient with proved influenza was admitted in the ordinary course to the hospital. This patient (case 3) was a woman of 47 who was admitted in a dying condition with pneumonia which had supervened on an attack of influenza starting five days previously. She died a few hours after admission. At autopsy the lungs showed a typical picture of hyperacute postinfluenzal bronchopneumonia with œdematous and hæmorrhagic consolidation, diffuse petechial hæmorrhages on the visceral pleura, and severe necrotic tracheitis and bronchitis. Fluid from the bronchi gave a pure culture of hæmolytic *Staphylococcus aureus*, and from the same fluid influenza virus B was isolated as described below.

TABLE III—ANTIBODY RISES OBSERVED IN CASES OF INFLUENZA A

Extent of rise	Melbourne A	Lee B
> 32 fold ..	1*	..
16–31 ,, ..	1 (1)	..
4– 7 ,, ..	1	1*
2– 3·5 ,, ..	2 (1)	2
< 2 ,, ..	1 (1)	3

* Case 22, also included in table II.

SCHOOL EPIDEMICS

Through the courtesy of the medical officers and headmasters we have obtained information about the extent and character of the epidemics among the boarders in three Victorian public schools (X, Y, and Z). In the third of these we made a relatively detailed study of the outbreak.

In school X the epidemic started on Sept. 30, and from Oct. 2 to Oct. 22 boys were admitted to the school hospital at the rate of about 5 a day. The incidence was higher in the junior school (79 cases among 150 boys, or 53%) than in boys over 14 years (107 out of 310, or 34·5%), but on the whole the older boys were rather more severely affected. The clinical features were those of typical influenza, coryzal symptoms coming on a day or two after the onset. Epistaxis was frequent, and there were 9 cases of otitis media. Serum samples from 3 cases all showed a sharp rise of antibody against influenza B.

In school Y 5 cases occurred among the boarders on Sept. 24. The weekly numbers of cases from this date were 26, 56, 23, 15, 8, and 2, the last case being on Nov. 4. Many of the patients were fairly ill and were in bed more than a week. The total of 130 cases represents 51% of the boarders in the school. Epistaxis was very frequent; nasal discharge and cough developed in most. There were 6 cases of otitis media in connexion with the epidemic. No serological investigations were made, and the epidemic is regarded as one of influenza B only by inference.

Through the courtesy of Dr. W. J. Denehy and with the coöperation of Mrs. Whiteside, the matron, we investigated the epidemic in one of the boarding-houses of school Z in considerable detail.

The house with which we were concerned had 15 adult residents and 60 boys, mostly between the ages of 13 and 16 years; 4 cases of influenza-like infection occurred between Oct. 1 and Oct. 18, but the main incidence was on Oct. 22, when 12 boys reported sick; 5 more cases appeared in the next two days, and subsequently there were 6 others spread over four weeks (see figure). The illnesses varied somewhat in severity but

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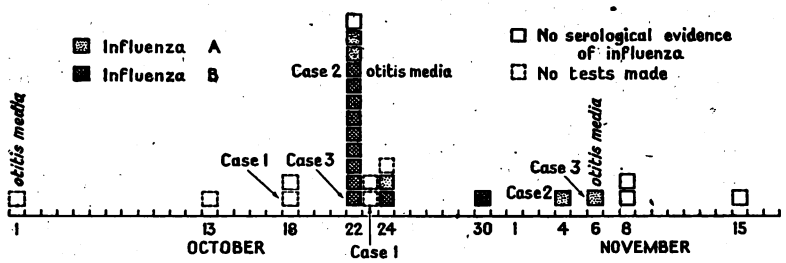

Time distribution of cases in small influenza epidemic in school Z. Each square represents an attack of clinical influenza; cases 2 and 3 had two attacks.

showed typical influenzal symptoms with toxic onset and usually rapid improvement within forty-eight hours. There were 3 cases of otitis media among 24 subjects (27 attacks of influenza) but no other complications.

The chief interest of this outbreak was the coexistence of influenza A and B infections. In 2, possibly 3, instances consecutive attacks of influenza A and B were experienced within two or three weeks.

COMBINED INFLUENZA A AND B IN SCHOOL Z

In this outbreak throat washings were obtained on the following day from all the boys who became ill on Oct. 22. Three washings from the 3 boys with highest temperatures were tested separately as well as a pooled specimen from the other patients. As shown in table I, all these were positive, B strains being obtained from cases 4 and 5 and pool I, while the remaining case gave a typical A strain. On Oct. 24 several more cases had occurred, and throat washings were obtained from practically all the residents in an attempt to detect subclinical infections. A day later these were inoculated into chick embryos in several pools. One of these pools was from 2 boys who on the day after that on which washings were obtained developed symptoms. From this pool a strain of influenza A was isolated. None of the other contact pools gave any positive results. A fourth strain of influenza virus B was obtained from a pool of washings from 4 clinical cases that had arisen on the 23rd or 24th.

On Nov. 4 case 5 had a second attack, thirteen days after the first; washings from this attack yielded a strain of influenza virus A.

Serological studies were made on 19 boys: 10 showed a significant antibody rise against influenza B, 3 against influenza A, 4 showed no antibody rise, and 2 (cases 5 and 22) gave evidence of two distinct attacks, one due to each type of virus (table IV).

As described above, virus type B was isolated from case 5 in his first attack and type A from his second. Suitably spaced serum samples taken at the time of each attack and a fortnight after the second showed antibody rises of the type to be expected. Case 22 was seen with a typical attack on Oct. 22, from which he recovered rapidly. A second attack on Nov. 4 was treated at home, and he was not available for a second bleeding until Nov. 19. The serum changes showed conclusively that he had been infected by both viruses, but it was not possible to say whether, as in case 5, influenza B preceded A or vice versa.

ISOLATION OF VIRUS FROM FATAL CASE

In case 3 the copious turbid fluid obtained postmortem from one of the larger bronchi was centrifuged and the supernatant fluid treated as a throat washing. In view, however, of the possibility of a high virus concentration being present, eggs were inoculated with a 1 : 100 dilution of fluid made in penicillin, horse serum, and saline as well as with undiluted material. The only positive result was obtained in one of the four embryos which survived after inoculation with the 1 : 100 dilution. Three survivors from the undiluted material showed no hæmagglutination by amniotic fluids.

In view of the possibility that the positive result was merely due to a laboratory contamination, the inoculations were repeated with material which had been stored at 4° C. Further, the negative amniotic fluids from embryos inoculated with undiluted material were pooled and subinoculated. Again the only primary isolation was in one embryo inoculated with the 1 : 100 dilution, but all survivors receiving pooled first-passage amniotic fluids gave a positive result. All the strains obtained were of type B, and there seems to be no reason why the results should not be taken at their face value. It is probable that growth of virus in the undiluted material was slowed down by the presence of antibody in the seropurulent fluid in which it was suspended.

This case is in all respects similar to those described by Scadding (1937) and Himmelweit (1943), from which A and B viruses respectively were isolated. It is probable that only in these hyperacute staphylococcal pneumonias supervening on influenza does death take place early enough for the virus to be isolated postmortem.

TABLE IV—TWO CASES OF CONSECUTIVE INFLUENZA B AND INFLUENZA A

—		First illness	Second illness	Convalescence
Case 5	Virus	B 4/5	A 2/4	..
	Antibody A	30	35	550
	Antibody B	20	120	140
Case 22	Virus	?	?	..
	Antibody A	15	..	480
	Antibody B	18	..	70

DISCUSSION

The fact that this mild epidemic of influenza occurred at an unusual time of year for Victoria adds interest to the coexistence of an appreciable minority of influenza-A infections in an epidemic predominantly due to influenza B. The immunological independence of the two concurrent infections is clearly shown by the instances reported of consecutive B and A infections in the same person. In view of the now rather numerous reports of minor prevalences or isolated cases of A or B influenza in non-epidemic periods, the coexistence of the two types may be merely coincidental. Nevertheless, the occurrence does support the speculations of Shope and others that there may be important factors still unknown which are responsible for initiating influenza outbreaks and might act similarly on both A and B types of infection.

The concentration of cases in schools and in country districts, with relatively few cases among the adult metropolitan population or in Army personnel, has, so far as we are aware, not previously been reported for an influenza epidemic. In Victoria we have obtained evidence that influenza B has been widely endemic in recent years, both from studies of respiratory infection in Army personnel during 1943 (Beveridge and Williams 1944) and from the antibody content of children's sera (Beveridge and Burnet 1944). It is therefore reasonable to ascribe the distribution of cases to immunological factors, the disease being capable of developing as an epidemic only in those populations which have largely escaped clinical or subclinical immunisation by the endemic strains of influenza virus B.

The method of isolation by amniotic inoculation of chick embryos with unfiltered material has given gratifying results with these strains of influenza B. A point of considerable academic interest is the absence of any

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evidence of an O phase in the B strains isolated, though all the 1945 strains of influenza A showed the typical O character (agglutination of guineapig cells to a much higher titre than fowl cells) on primary isolation.

SUMMARY

An epidemic predominantly of influenza B but including a considerable proportion of influenza A cases, and particularly involving schools and country districts, occurred in Victoria in October, 1945.

Virus was readily isolated from throat washings by the inoculation of unfiltered material plus penicillin and a soluble sulphonamide into the amniotic cavities of chick embryos.

Besides those mentioned in the text, we are grateful to Dr. E. W. Abrahams, of the Royal Melbourne Hospital, Dr. R. Scott Good, Mr. F. W. Rolland, and Dr. G. Cole for help in this investigation.

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CORTICAL MASTOIDECTOMY

USE OF PENICILLIN IN PLASMA CLOT

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"Of great consequence is the management of the dead spaces in wounds."—Halstead (1890).

IN the after-treatment of the cortical mastoidectomy wound the method of Florey and Florey (1943) has proved its worth. Satisfactory results have been reported by Swanson and Baker (1944), Macbeth (1945), and Allman (1945). Briefly, this method consists of repeated injections of penicillin solution into the mastoid cavity through a tube which passes into the cavity through a snugly closed suture line.

The procedure described below is intended to simplify the aftercare; it is also an attempt to combine the advantages of local penicillin therapy with some of the virtues of the old "blood-clot mastoidectomy" described by Reik (1906) and Sprague (1906). Penicillin powder is dissolved in plasma, and the solution is introduced into the cavity and clotted rapidly in situ by the addition of thrombin. The soft tissues are sutured without any drain. In this way a fibrinous framework is supplied to act as scaffolding for the desired granulation tissue, and in the meshes of this fibrin the penicillin is retained.

The following items are required in the theatre besides the usual surgical equipment:—

(1) *Penicillin.*—An ampoule of 100,000 units of penicillin powder is brought to the theatre a few minutes before the beginning of the operation. The rubber cap of the ampoule is sterilised and pierced with a needle; 2 or 3 c.cm. of plasma are injected, and the powder is left to dissolve in a cool place while the operation is in progress. The amount of plasma depends on the size of the cavity to be filled. The dosage of penicillin is purely empirical; a smaller dose might be just as effective. In a few cases bilateral mastoidectomies were done, and the 100,000 units were shared between the two cavities, with satisfactory results. The first 18 cases were treated with calcium penicillin and later cases with sodium penicillin; no appreciable difference was noted in the clinical results.

(2) *Plasma.*—Fluid plasma, from the plasma bank, is taken to the theatre in sterile stoppered tubes, each containing some 6 c.cm. To copy more faithfully the original blood-clot technique, the patient's own blood, withdrawn by venepuncture, might be used; but the opacity of the blood would make it difficult to see whether the penicillin powder was completely dissolved in the ampoule. Plasma, being translucent, allows one to see that the ampoule is emptied completely.

(3) *Thrombin.*—The addition of thrombin to blood or plasma causes the precipitation of fibrin and produces a fibrin clot. The drug is standardised in terms of the Iowa unit, one such unit being the amount of thrombin which will clot 1 c.cm. of standard fibrinogen solution in 15 sec. (Young 1944). The ampoule in which it is supplied * contains 5000 units of thrombin in the form of a white powder. This powder is readily soluble in the 5 c.cm. of sterile water contained in an accompanying ampoule. The water is drawn up in a sterile syringe, injected into the ampoule containing the thrombin powder, and again drawn up in the syringe, ready for use. Being a powerful coagulant of blood it should never on any account be injected into the tissues.

TECHNIQUE

A cortical mastoidectomy is performed, great care being taken to open and drain all accessible cells, whether obviously infected or not. The tip of the mastoid process is removed as a matter of routine. Removal of bone is carried well forwards into the antrum, and both the external semicircular canal and the posterior limb of the incus are exposed. Granulations and swollen muco-endosteum blocking the antrum and aditus are picked out, so that a free passage is obtained to the attic.

At the end of the operation hæmostasis must be complete. Every bleeding point in the soft tissues requires ligation. Venous bleeding from the cut surface of the bone is checked by snipping off a small pledget of temporalis muscle, moistening it with a few drops of thrombin solution, and holding it against the bleeding spot for a few moments, when it will adhere firmly. General oozing from the bone and soft parts is arrested by spraying some of the thrombin solution from the syringe over the surface of the wound.

The incision is then sutured from below upwards, the top stitch being for the moment left untied. Any blood-clot in the cavity is aspirated. The plasma, with the penicillin in solution, is drawn up from the ampoule with needle and syringe and squirted into the cavity through the gap in the suture line at the top of the incision. A few drops of the thrombin solution are run into the cavity at the same time. If the capacity of the dead space has been overestimated and the solution threatens to flow over the top of the wound, gentle traction on the untied suture and on the pinna outwards and forwards increases the size of the cavity temporarily and so takes up the excess of fluid. If the suturing of the soft tissues has been exact, no leakage takes place from the suture line. Accurate closure of the skin is ensured by using a vertical mattress-stitch in closing the skin incision. The adult's cortical mastoidectomy cavity requires 3 or 4 c.cm. to fill it.

Until the plasma clot is obviously formed, care should be taken that the fluid is not allowed to slop over the top of the wound and so be wasted. In one or two minutes the plasma is usually firmly clotted, and the top suture can then be tied. The rate of clotting varies directly with the concentration of the thrombin solution, which can be varied at will by using more or less of the sterile water in making the thrombin solution. The most rapid clotting is obtained by shaking a little of the thrombin powder into the puddle of plasma, as it lies in the wound. If the technique has been correctly followed, there is no wastage of penicillin; and, once the clot has formed, no fear of leakage need be entertained.

No drain is placed in the wound, which is left firmly sutured, and a strip of 'Vaseline' gauze is laid on it. The external auditory meatus is cleaned, and a narrow wick of gauze is placed in it. The usual dry dressings and bandage are applied and are not disturbed till the sixth day, when the sutures are removed.

* The thrombin used is 'Thrombin Topical' (P.D. CO.).

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A series of 54 consecutive and unselected cases requiring cortical mastoidectomy has been treated by this method: 23 patients had retro-auricular œdema or abscess; 2 had zygomatic swelling; and 1 had Bezold's mastoiditis. The indication for operation on the 28 others was the persistence of profuse purulent otorrhœa, maintained fever, or sagging of the meatal roof. In 3 patients bilateral mastoiditis was present.

RESULTS

Four cases must be withdrawn from this analysis because, though primary healing of wound and tympanum was obtained, they were also treated with intramuscular injections of penicillin during their convalescence from operation. One of them had mastoiditis and nasal pan-sinusitis; two had acute influenzal otitis media of the other ear; and the fourth had extensive granulations on the cerebellar dura and lateral sinus, and septicæmia was feared. For the relief of these complications it was thought wiser to give systemic penicillin.

The discarding of these 4 cases reduces the series to 50, of which there was primary healing of the wound in 46, and of the tympanic membrane in 48.

The Wound.—One child had to be transferred to a fever hospital because of faucial diphtheria a few days after the operation, and his wound broke down and continued to discharge for three weeks; it subsequently healed without further surgical intervention. Another child had a profuse purulent discharge from the wound, which ceased in ten days. Both of these were definite failures; they were among the first cases treated by this technique, and probably a technical fault at the time of the operation was responsible. In 2 cases there was a discharge of a small quantity of altered blood from the lower end of the incision, though both incisions were healed in ten days. The remaining 46 cases showed clean primary healing of the wound on the sixth or seventh day, when the dressings were first removed.

The Tympanic Membrane.—One child had a very large postero-central perforation of the drumhead before operation. The perforation was dry ten days after operation but still persists as a dry hole in the centre of the membrane. Another had had otorrhœa for two years, and this technique had no effect on the otorrhœa. Later a modified radical mastoidectomy was performed, revealing an unsuspected cholesteatoma in the attic. This failure is more rightly attributed to an unsuitable operation than to a failure of the particular technique employed. The remaining 48 drumheads were dry on the seventh day.

DISCUSSION

The advantages of this method are obvious. The patient is freed from the fear and pain of repeated mastoid dressings, and the time of the medical and nursing staff is not consumed in doing daily dressings, or, as in the Floreys' method, six-hourly aspirations and perfusions.

Various disadvantages may be met with, though they are missing from the present series, and various criticisms may be made:

(1) The plasma, being a foreign protein retained in the wound, may cause harmful effects. No ill effects have been noted. Probably no plasma gets into the circulation, since it is clotted within a minute of its admission to the wound.

(2) If the infecting organism is resistant to the action of penicillin the operation will fail. For this reason the technique has been employed only in acute infections, where the organism is usually sensitive to penicillin. Bacteriological examination of the pus from these cases showed hæmolytic streptococci or pneumococci in 40 mastoids. The responsible organisms were sensitive to penicillin in all but 2 mastoids, of which one showed a growth of *H. influenzæ*, and the other (the case with two years' otorrhœa) showed a heavy mixed infection. Where chronic infection is present this technique is contra-indicated.

(3) The organisation of fibrin in the middle ear might lead to the formation of intratympanic adhesions and thus reduce the acuity of hearing. The effects on the hearing, when this technique is used, compare favourably with those resulting from other techniques, though in most of the cases only a few months have elapsed since the operation, and it may be too early to judge what the final effect on the hearing will be.

(4) The penicillin might be subject to serum inactivation (Bigger 1944). This probably takes place to some extent but does not appear to affect the clinical result. The growth of a standard staphylococcus is inhibited by the urine for about thirty-six hours after the introduction of the penicillin into the wound. It is fair to assume that, during this time, the fibrin clot yields its penicillin, little by little, to the newly formed vascular loops, as they grow into it.

SUMMARY

A method of retaining penicillin in the bony cavity of the cortical mastoidectomy wound is described. The technique is derived from the "blood-clot mastoidectomy" and consists of dissolving penicillin powder in plasma, pouring this solution into the wound, and immediately clotting it with thrombin.

My thanks are due to Dr. K. Thompson and Dr. A. E. Chaplin, of the pathological department, Selly Oak Hospital, for their helpful collaboration.

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HÆMOLYTIC ICTERUS (ACHOLURIC JAUNDICE) CONGENITAL AND ACQUIRED

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A Report to the Medical Research Council from the S.W. London Blood-supply Depot

IN Britain the term acholuric jaundice has been applied to one particular syndrome of hæmolytic anæmia, characterised by jaundice without bilirubin in the urine, anæmia, and splenomegaly, with increased reticulocytes in the circulating blood, spherocytosis of the non-reticulated red cells, and increased fragility of the red cells to hypotonic saline. A congenital form was first described by Minkowski (1900) and Chauffard (1907). This has a family background, the condition being inherited as a mendelian dominant character. An acquired variety has also been postulated. Hayem (1898, 1908) described cases of jaundice with splenomegaly, due he thought to a chronic infection, but it was Widal et al. (1907a, b, c, 1908, 1909, 1912) who, in a series of brilliant papers, clearly defined and summarised the clinical and hæmatological features of the acquired form. Latterly, the existence of the acquired form has been denied or doubted, notably by Lord Dawson (1931) and Vaughan (1936); it is assumed that in such cases the condition has been previously mild and unnoticed, and that examination of a sufficiently large number of relatives would have revealed latent cases with increased fragility of the red cells. Nevertheless, reports of cases of the

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apparently acquired form continue to appear, and in the U.S.A. at least its existence is accepted.

The true aetiology of the condition is unknown, though several hypotheses have been put forward to explain the phenomena: a hereditary defect of the erythron (Naegeli 1931); undue stasis and destruction of blood in the splenic pulp (Ham and Castle 1940a, b); and a circulating hæmolysin (Dameshek and Schwartz 1940). Chauffard and Vincent (1909) first demonstrated a hæmolysin in a case of acquired acholuric jaundice, and sporadic reports of similar cases with demonstrable hæmolysins continue to appear. Dameshek and Schwartz (1938) produced in guineapigs the hæmatological phenomena of acholuric jaundice by the injection of suitable doses of anti-guineapig rabbit serum. The same authors (1940) have reviewed the subject of acquired hæmolytic icterus, acute type, and have noted the instances where hæmolysins have been demonstrable. They go so far as to suggest (p. 306) that congenital acholuric jaundice might possibly be produced by continued small doses of hæmolysin.

If it be admitted that there are two types of acholuric jaundice, the congenital and the acquired, and that the prognosis is better in the congenital cases (this is widely admitted) who are *ictériques plutôt que vraiment malades*, much labour would be saved if there were a simple test to distinguish the two. It is often extremely difficult to trace all the members of a family and, when they are traced, extremely tiresome doing accurate and quantitative red-cell fragility tests on their bloods. Moreover, the customary tests for the detection of serum hæmolysins are tedious and the results often negative or equivocal, even when there are reasonable grounds for being certain of the presence of a hæmolysin. The reports of Coombs et al. (1945a, b) of a test with an anti-human-serum rabbit serum for sensitised human red cells seemed to indicate a possible discriminating test. If Naegeli's (1931) or Ham and Castle's (1940a, b) theory of acholuric jaundice be correct, the red cells from such a case should, when washed in saline, not have adsorbed human serum antibody on the cell surface and thus should not be agglutinated by an anti-human-serum rabbit serum. On the other hand, Dameshek and Schwartz's (1940) conception of a hæmolysin acting on the red cells in cases of acquired, and perhaps also in congenital, acholuric jaundice suggests that the washed cells from such cases would have adsorbed serum antibody and would be agglutinated by the anti-human-serum rabbit serum.

In this communication it is proposed to report the results of tests in which anti-human-serum rabbit sera were set up against the washed cells of 22 patients

TABLE I—FINDINGS IN 17 CASES OF CONGENITAL ACHOLURIC JAUNDICE

Case	Sex	Age	Hb (%)	Plasma-bilirubin (mg. per 100 c.cm.)	Reticulocytes (%)	Splenectomy	Agglutination of red cells with anti-human-serum rabbit serum
1	M	..	..	0·32	0	+	—
2	M	10	92	4·8	12·0	—	—
3	F	69	107	0·7	1·5	+	—
4*	F	..	98	0·16	0·5	—	—
5	F	5	86	0·5	3·0	+	—
6	F	23	?	3·0	11·0	—	—
7	M	..	53	3·2	9·5	—	—
8	F	40	96	0·8	0·5	+	—
9	M	..	85	2·6	..	—	—
10	F	12	90	0·7	0	+	—
11	F	18	90	0·5	0·3	+	—
12	F	18	80	2·7	12·0	—	—
13	F	50	76	5·7	7·0	—	—
14	F	78	82	2·7	4·0	+	—
15	F	30	85	1·6	1·0	+	—
16	M	24	..	..	..	+	—
17†	M	19	50	19·2	16·0	—	—

* Mother of case 5. Latent acholuric jaundice? No clinical signs, but increased fragility of red cells.
† Obstructive jaundice also. Pigment stone in common bile-duct?

TABLE II—FINDINGS IN 5 CASES OF ACQUIRED ACHOLURIC JAUNDICE

Case	Sex	Age	Tested (date 1945)	Hb (%)	Reticulocytes (%)	Serum-bilirubin (mg. per 100 c.cm.)	Date of splenectomy	Agglutination of red cells with anti-human-serum rabbit serum
1	M	67	Oct. 27 PM blood 48 hrs. old	..	..	..	April 21, 1943	+
2	F	46	Oct. 20	98	<1·0	0·16	Jan., 1943	++
3	F	44	Sept. 13	47	51·0	7·2	Sept. 25, 1945 (died Oct. 16, 1945)	..
			Sept. 19	62	8·0	4·8		+++
			Sept. 29	72	6·0	1·3		+++
			Oct. 1	70	5·0	3·2		++
			Oct. 12	61	3·0	3·6		..
4	M	39	Sept. 20	38	28·0	..	July, 1945 (died Nov. 23, 1945)	+++
			Oct. 17	38	51·0	4·8		++
5	F	29	Sept. 27	30	..	3·3	Oct. 4, 1945	++
			Oct. 1	29	52·0	..		++
			Oct. 8	100	1·0	..		+
			Oct. 12	78	1·0	..		+++
			Oct. 20	81	0·5	0·9		+++
			Nov. 9	86	5·0	..		++

PM = postmortem

with acholuric jaundice as defined above, and of 6 patients with hæmolytic anæmia apparently acquired but not conforming to the criteria of acholuric jaundice.

METHOD

Blood was taken from the cases and the red cells were washed three times in normal saline. The washed cells were then resuspended in saline to make approximately a 2% suspension and then mixed with equal volumes of a suitably diluted anti-human-serum rabbit serum. The mixture was allowed to stand for an hour or longer at room temperature and then inspected macroscopically and microscopically for agglutinates, as advised by Coombs et al. (1945a, b).

RESULTS

The findings in the cases with acholuric jaundice, together with certain relevant clinical and hæmatological features, are summarised in tables I and II. The washed red cells from the 17 patients with congenital acholuric jaundice were in no case agglutinated by the anti-human-serum rabbit serum. The red cells from the 5 patients with acquired acholuric jaundice were, however, all agglutinated by the reagent.

The cases of acquired hæmolytic anæmia not conforming to the criteria of acholuric jaundice were as follows:

CASE 1.—Marchiafava-Micheli syndrome (nocturnal hæmoglobinuria).

CASES 2 and 3.—Refractory anæmia with signs indicative of complicating hæmolysis: unduly rapid fall of Hb after blood-transfusion, not explained by acquired immune antibodies, and in one case a proved maximal red-cell survival-time of transfused blood of forty days.

CASE 4.—Hæmolytic anæmia, ? secondary to malignant hæmangiomata of liver and spleen (necropsy findings).

CASES 5 and 6.—Chronic hæmolytic anæmia with abundant signs of red-cell regeneration in peripheral blood: polychromatophilia and reticulocytosis. One case unaffected by splenectomy.

All these cases had red-cell fragility within normal limits and did not show spherocytosis. In all cases the washed red cells were not agglutinated by anti-human-serum rabbit serum.

The sera of three of the patients with acquired acholuric jaundice (table II, cases 1, 2, and 4) were examined for hæmolysins by the routine techniques. No hæmolysin was discovered by these methods. Auto-agglutinins had been present in the sera of cases 1 and 2 and were just

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detectable at room temperature at the height of the hæmolytic process in 1942 and 1943. They were not detected at room temperature, however, in 1945, when the tests with anti-human-serum rabbit serum were carried out. Postmortem blood only was available from case 1 for the agglutination test. This patient died of pulmonary embolism on the day he was due for his routine follow-up examination. In case 4 the serum separated at room temperature clumped his own and all group-O red cells, both at room temperature and at 37° C. It was not proved whether this was due to auto-agglutination or to pseudo-agglutination. No agglutinin could be recovered in saline from the clumped cells. In cases 3 and 5 no auto-agglutination was detected at room temperature.

Serum from cases 1, 3, 4, and 5 (table II), and from some of the patients with congenital acholuric jaundice was incubated with red cells from a healthy group-O subject. The cells were subsequently washed three times in saline and set up with anti-human-serum rabbit serum. No agglutination resulted.

DISCUSSION

The washed red cells of patients with congenital acholuric jaundice were not agglutinated by an anti-human-serum rabbit serum. Of the 17 cases in which the test was applied 16 were classical cases; the 17th was an apparently normal woman, the mother of a child who had been jaundiced and anæmic from birth and presented the classical features of the condition and whose anæmia and jaundice were successfully relieved by splenectomy. This woman may have been a latent case, as the fragility of her red cells was definitely increased. Of the 16 classical cases, 9 were tested at various periods after a successful splenectomy. Of the 7 patients who retained their spleens, 5 were more or less compensated and 2 were considerably anæmic. It is notable, therefore, that despite the variations in the clinical state of the patients, the agglutination test was uniformly negative.

On the other hand, of the 5 patients with acquired acholuric jaundice cases 1 and 2 (table II) had had successful splenectomies more than two years previously and had been symptomatically cured and were living normal lives. Their blood-counts and hæmoglobin percentages were within the normal range, but the spherocytosis and increased fragility to hypotonic saline had persisted. They were thus clinically and hæmatologically similar to cases of congenital acholuric jaundice. Nevertheless, their red cells when washed showed agglutination with anti-human-serum rabbit serum. Their cells were not so strongly agglutinated as the cells of cases 3, 4, and 5 (table II), who were tested while in the active hæmolytic phase, but the agglutination, even in case 1, where only postmortem blood was available, was distinct. Case 4 was a man with chronic fibroid active phthisis who had apparently developed this acquired acholuric jaundice in the spring of 1945 and for whom splenectomy in July, 1945, had had little effect on the hæmolytic process. Cases 3 and 5 were both women with about 6 months' history of anæmia and jaundice. They presented the classical features of acquired acholuric jaundice, and both were submitted to splenectomy within a week or so of each other in September–October, 1945. In both cases there was an immediate remission of the hæmolysis, which in case 5 has been maintained. Case 3 died three weeks after the splenectomy, with multiple thromboses. Terminally, there were signs of an exacerbation of the hæmolytic process. In cases 3, 4, and 5 (table II) the agglutination of the washed cells by the anti-human-serum rabbit serum was well marked, but the degree of agglutination appeared unrelated to the clinical or hæmatological conditions. This may have been due to the fact that the anti-human-serum r abbit serum was derived from several different sources during this time, and no standardisation of the reagents as yet been attempted.

The 6 cases of acquired hæmolytic anæ ia not conforming to the acholuric jaundice syn rome were obviously cases of varied ætiology, but again heir washed red cells were not agglutinated by anti-h man-serum rabbit serum.

The results summarised in tables I and show that there is a well-marked serological differe ce between the red cells in congenital acholuric jaun lice and in acquired acholuric jaundice, in spite of t e fact that morphologically they are indistinguisha le. This suggests an ætiological difference also betw en the two conditions. As Coombs et al. (1945a and b) have shown that an anti-human-serum rabbit serum will agglutinate red cells sensitised by weak anti-Rh agglutinins or by incomplete Rh antibodies, it is probable that acquired acholuric jaundice is due to the action of an immune antibody on the patient's red cells. However, it was not possible to demonstrate by their technique such antibody in the serum of these cases. The red cells must therefore have adsorbed all the available antibody from the serum, as suggested by Dameshek and Schwartz (1938).

The fact that the red cells of cases of congenital acholuric jaundice are not agglutinated by the anti-human-serum rabbit serum suggests that in this condition the spherocytosis and the unduly rapid hæmolysis of the patients' red cells in vivo are not due to sensitisation by an immune antibody. This confirms the previous observations made in this laboratory (Dacie and Mollison 1943) that normal red cells when transfused to a patient with congenital acholuric jaundice survive as in a normal recipient. Had a hæmolysin or abnormal metabolite been acting, as suggested by Dameshek and Schwartz (1940), it appears unlikely that it would be strictly specific for the patient's own cells.

SUMMARY

The washed red cells of 5 patients with acquired hæmolytic icterus (acholuric jaundice) were agglutinated by an anti-human-serum rabbit serum. Agglutination was obtained whether the patient was in an actively hæmolytic state or in remission after splenectomy.

The washed red cells of 17 patients with congenital hæmolytic icterus were not agglutinated by the anti-human-serum rabbit serum.

It is suggested that this agglutination test will discriminate the congenital from the acquired form, and that it indicates that the acquired form is due to a process of immunisation, whereas the congenital form is not.

We should like to thank the numerous physicians and surgeons who have allowed us to investigate their cases; and Dr. R. R. Race for much advice and generous gifts of anti-human-serum rabbit serum.

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RELATION OF THE ADRENAL CORTEX TO ARTHRITIS

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SINCE Billings (1912) first attracted attention to focal infection as an ætiological factor in chronic arthritis, it has been credited with an important relation to arthritis and "rheumatism" in general. In 1931 Nicholls and Stainsby demonstrated agglutinins for *Streptococcus hæmolyticus* in the sera of patients with rheumatoid arthritis. Evidence for the incrimination of a virus was provided by Eagles et al. (1937), who found elementary bodies in the joint fluids in some cases of rheumatoid arthritis. These are but a few of the many observations which provide a basis for the view that arthritis is caused by infection. It was therefore of profound importance when Selye et al. (1944) claimed to have produced arthritis in rats by repeated injections of desoxycortone acetate. In these experiments, in addition to injections of desoxycortone, the rats were unilaterally nephrectomised and given 1% saline to drink instead of water, since, according to Selye and Pentz (1943) and Selye et al. (1943 and 1945), these procedures sensitise the animal to the effects of desoxycortone. These experiments were all the more important because, in addition to the arthritis, nephrosclerosis was found in the remaining kidney in every animal that had received desoxycortone, and Baggenstoss and Rosenberg (1943), in the first comprehensive analysis of the visceral lesions found at necropsy in cases of rheumatoid arthritis, demonstrated kidney lesions in 27 out of 30 cases, 19 of them presenting evidence of glomerulitis.

Selye and his co-workers (1944) describe two major experiments. In the first experiment 28 female albino rats (female rats are more sensitive than male rats to desoxycortone) were injected subcutaneously with 2 mg. of that drug twice daily for twenty days; all the rats were unilaterally nephrectomised, and all had 1% saline to drink, and the desoxycortone was in an aqueous suspension containing 20 mg. per c.cm. The rats were divided into three groups: 10 having bilateral adrenalectomy and 10 thyroidectomy, performed at the same time as the unilateral nephrectomy, and 8 serving as controls. All the rats were fed on "purina fox chow," the thyroidectomised rats having calcium lactate ad lib. in addition. The second experiment was in essentials similar to the first, except that there were 34 rats, each rat receiving 3 mg. of desoxycortone twice daily for twenty-six days, and there were four groups of rats, 10 being bilaterally adrenalectomised and 10 thyroidectomised (in addition to unilateral nephrectomy), and two control groups, one group of 8 rats receiving 3 mg. of desoxycortone twice daily after unilateral nephrectomy, and one group of 6 rats having neither desoxycortone nor nephrectomy. The animals of the last group showed no pathological changes.

TABLE I—ANALYSIS OF RESULTS OF EXPERIMENTS OF SELYE ET AL. (1944)

Expt.	Treatment	Arthritis	No arthritis	Total
I	DCA + adrenalectomy	6	4	10
	DCA + thyroidectomy	2	8	10
	DCA only	1	7	8
	Total	9	19	28
II	DCA + adrenalectomy	4	6	10
	DCA + thyroidectomy	4	6	10
	DCA only	3	5	8
	Total	11	17	28
I and II combined	DCA + adrenalectomy	10	10	20
	DCA + thyroidectomy	6	14	20
	DCA only	4	12	16
	Total	20	36	56

DCA = desoxycortone

TABLE II—ANALYSIS OF SOME OF THE EXPERIMENTS IN WHICH LARGE DOSES OF DESOXYCORTONE HAVE BEEN INJECTED FOR LONG PERIODS

Reference	Dose of desoxycortone	Duration of injections	Sex of rats	Unilateral nephrectomy
Selye and Dosne (1940)	10 mg. daily	20 days	M & F	No
Selye and Hall (1943)	5 mg. twice daily	20 days	?	No
Selye and Pentz (1943)	3 mg. twice daily	27 days	F	Yes
Selye et al. (1943)	3 mg. twice daily for a month; then 5 mg. twice daily	53 days	M & F	No
Ludden et al. (1941)	1 mg. daily	6 wks.	M	No
Carnes et al. (1941)	5 mg. daily	8 wks.	M & F	No
Durlacher et al. (1942)	2 mg. daily	4 wks.	M & F	No

All the injected rats in both experiments showed evidence of nephrosclerosis, periarteritis nodosa, or rheumatic nodules. The results of experiment I and the first three groups of experiment II are shown in table I. In view of the fact stated in the paper that "... thyroidectomy or adrenalectomy greatly facilitated the production of joint lesions ..." it is interesting to analyse these results statistically. For experiment I, it is seen that $\chi^2 = 5{\cdot}71$, $n=2$, and P is greater than 0·05; for experiment II, $\chi^2 = 0{\cdot}013$, $n=2$, and P is greater than 0·99. When both experiments are combined, as in table I, $\chi^2 = 2{\cdot}78$, $n=2$, and P is greater than 0·20. Thus the statement quoted above is not justified by statistical analysis, and the factors of adrenalectomy and thyroidectomy can therefore be discounted. Consequently only the specific effects of desoxycortone have come under consideration in this paper.

Despite the fact that many workers in the past have injected large doses of desoxycortone repeatedly over long periods (table II), apparently without ever observing arthritis, it was decided to repeat the experiments of Selye et al. (1944) in detail without subjecting the rats to either thyroidectomy or adrenalectomy. In repeating these experiments it was found essential to take into consideration the factors of infection and exposure to low air temperature, which certainly complicate the investigation described by these workers.

EXPERIMENTAL METHODS

Owing to the scarcity of desoxycortone it was impossible to plan an experiment with as many animals as had been originally intended; however, in view of the results of the experiment, the primary object of which was to determine the relation of desoxycortone to arthritis, the number of animals used proved adequate. During the experiment, when the action of desoxycortone became apparent, it was evident that the effect of some other factors had to be considered. The most obvious seemed to be those of infection and low air temperature, for many of the rats in the experiments of Selye et al.

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(1944) died spontaneously of pneumonia, and it is specifically stated that a fall in temperature took place. These two factors were taken into consideration, thereby unavoidably complicating the experimental procedure. Therefore the experimental methods and results can be described in two groups: group A related to the direct effect of repeated doses of desoxycortone, and group B related to the complicating factors.

Group A: Repeated Doses of Desoxycortone.—The experiment was carried out on 10 female albino rats, 5 from each of two litters. All were subjected to left unilateral nephrectomy (posterior approach) under general ether anæsthesia. From the day of operation all rats were given 1% saline instead of drinking-water and were fed on cabbage or carrot, bread, and rat cake.* All the rats were kept in a small room at a temperature not less than 65° F and not greater than 75° F, with an average of 70° F, the temperature being controlled by an electric heater. On the fifth day after operation rats 1, 2, and 3 of litter I and rats 1 and 4 of litter II were selected by randomisation for injection, and subcutaneous injections were started in the selected rats. Each rat was injected with 3 mg. of desoxycortone twice daily from an aqueous suspension containing 30 mg. per c.cm., and the injections were continued for twenty-four days. Rat 3 of litter I developed a hæmatoma subcutaneously at the site of operation, which resolved before the end of the twenty-four days. On the twenty-fourth day rat 5 of litter I and rats 1, 3, and 4 of litter II were selected by randomisation for necropsy.

Group B: Repeated Doses of Desoxycortone with Effect of Complicating Factors.—Next day the remainder of the rats were placed in their cages 2 ft. from an electric fan blowing on the rats over ice in a wide shallow tray for 30 min.; four hours later this was repeated for an hour with the fan at 18 in. In both cases the temperature recorded by a thermometer placed in contact with the cages was not greater than 65° F and not less than 60° F. Three days later the rats, inside their cages, were placed in a refrigerator. The door of the refrigerator was left open, and 2 ft. from it an electric fan was placed so as to blow into the refrigerator. With this procedure the temperature recorded by a thermometer placed in contact with the cages did not fall lower than 60° F. Next the refrigerator door was shut, and the rats were left inside for an hour, after which the thermometer (left inside with the rats) recorded 40° F. When the door was opened

Fig. 1—Interstitial fibroblastic proliferation and hyaline degeneration of myocardial arterioles in rat 2 of litter II (infected only). (×94.)

after this period, the fan was again directed into the refrigerator for 10 min. after which the temperature rose to 60° F. Next morning rat 3 of litter I was found dead and subjected to necropsy. The remaining rats were again placed in a refrigerator for two hours, the average temperature inside the refrigerator being 44° F. Next morning these rats were placed by an open window; although the temperature in this situation did not fall any lower than 63° F, the rats were subjected to a considerable draught and were left here for eleven days.

Since by this time, the forty-first day of the experiment, none of the rats showed any evidence of pneumonia or arthritis, despite the rigorous procedure to which they had been subjected, it was decided to produce pneumonia in them by direct methods. Accordingly, on this day the trachea of each of the rats was exposed through a midline incision in the neck, under general ether anæsthesia, and 0·75 c.cm. of a broth suspension of pneumococci (type unknown, because the bacteria had lost their capsules) containing about 1000 million bacteria per c.cm. was injected into the trachea of each rat. The virulence of these bacteria had not been increased by serial passage through other animals. During the next seven days, although all the rats were listless and had excessive conjunctival secretion, there was no direct evidence that any of them had pneumonia. Therefore on the forty-eighth day of the experiment 0·25 c.cm. of a broth suspension

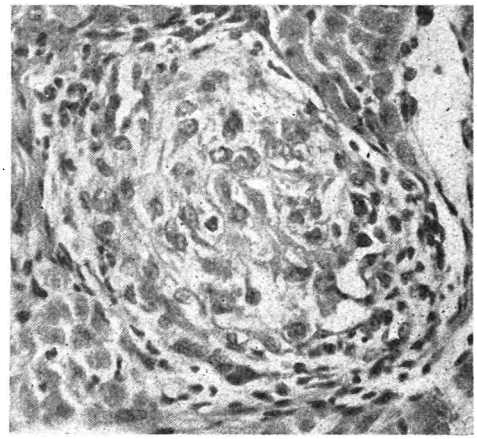

Fig. 2—Aschoff body in rat 5 of litter II (infected only). (×330.)

of *Staph. aureus*, containing about 1000 million bacteria per c.cm., was injected directly into the right lung of each rat through the fifth intercostal space in the midaxillary line. The virulence of these bacteria had similarly not been increased. Within four hours all the rats were listless and very cold to touch, and the skin of each rat had lost its elasticity. Within six hours they were all sneezing and having great difficulty with respiration. Next morning rat 2 of litter I, and in three more days rat 2 of litter II, died. On the fifty-third day of the experiment the 3 remaining rats were killed.

The experimental procedure therefore involved the following four series:

Group A { (1) Normal (no injection or infection)
(2) Injected only

Group B { (3) Infected only
(4) Injected and infected

At necropsy the mesentery of every animal was closely examined for evidence of periarteritis nodosa, and the remaining kidney, the heart, the adrenals, and the whole of all the feet, knee-joints, and elbow-joints, together with selected pieces of other organs, were removed from each rat for histological study. The joints were imbedded in celloïdin and all other tissues in paraffin. All sections were stained with Ehrlich's hæmatoxylin and eosin.

RESULTS

Group A: Uninfected Rats.—There were no deaths in this group. None of the rats at any period during the experiment showed any naked-eye evidence of arthritis or of periarteritis nodosa in the mesentery.

On histological examination no evidence of arthritis was found in the *joints* of any of the rats. The *hearts* of the non-injected rats (rat 3 of litter II and rat 5 of litter I) were ostensibly normal in every respect. The myocardium of the injected rats (rats 1 and 4 of litter II) showed slight muscle-cell necrosis; the interstitial tissue of the myocardium showed slight patchy infiltration with small "histiocyte" cells, but nowhere was there any swelling of the collagen framework, and nowhere was there seen any structure resembling an Aschoff body, according to the histological criteria

* Supplied by the North Eastern Agricultural Society Ltd., Aberdeen.

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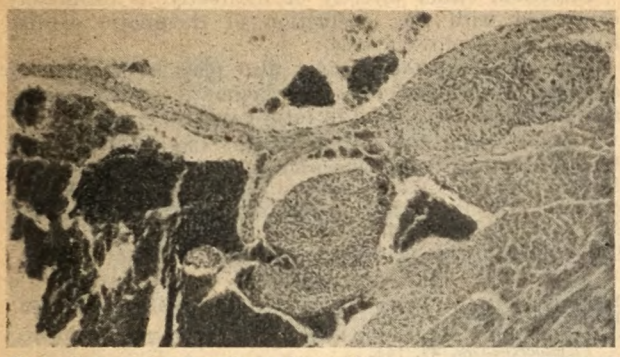

Fig. 3—Rheumatic vegetation at base of heart valve in rat 2 of litter II (infected only). (×65.)

laid down by Gross and Ehrlich (1934). No vegetations were seen.

As regards the *kidneys*, all the rats (rats 1, 3, and 4 of litter II and rat 5 of litter I) had glomerular lobulation and increase in number of nuclei in the capillaries of the glomerular tufts—i.e., the changes of acute glomerulonephritis—with some hypertrophy of the proximal convoluted tubules (fig. 5). There was no difference in degree in this change between the injected and the non-injected rats.

No evidence of pneumonia was found, and the adrenal cortex of both the injected and the non-injected rats appeared normal.

Group B: Infected Rats.—During the experiment 3 of the 5 rats died; all 5 were subsequently found at necropsy to have bronchopneumonia. None of the rats

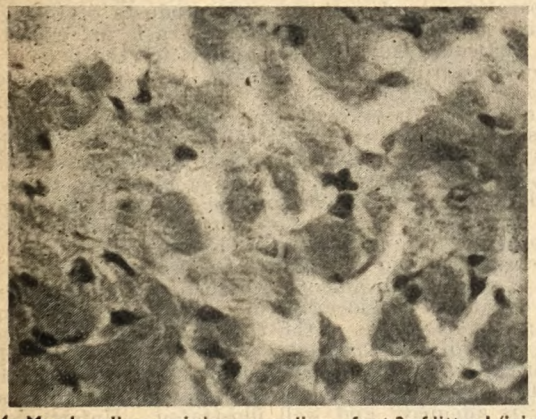

Fig. 4—Muscle-cell necrosis in myocardium of rat 2 of litter I (injected and infected). (×570.)

at any period during the experiment showed any naked-eye evidence of arthritis or of periarteritis nodosa in the mesentery.

On histological examination no evidence of arthritis was found in the *joints* of any of the rats. The *hearts* of 2 of the 3 non-injected rats (rats 2 and 5 of litter II) showed profound changes, especially in the interstitial tissue of the myocardium, the muscle-cells showing little or no change. There was a considerable increase in collagen and fibrous tissue (fig. 1), and typical Aschoff bodies were seen scattered throughout the heart (fig. 2). At the base of the valves, in several places, structures resembling rheumatic vegetations were visible (fig. 3). The walls of the myocardial arterioles showed pronounced hyaline degeneration (fig. 1), and the pericardium considerable infiltration with small round cells. Rat 4 of litter I, the other non-injected rat, showed changes very similar to these but not so great; although the interstitial fibroblastic proliferation, collagen swelling, and hyaline degeneration of the arteriolar walls were considerable, no structure definitely resembling an Aschoff body was seen, and the valves bore no vegetations. The interstitial myocardial tissue of rats 1, 2, and 3 of litter I (the injected rats) showed very slight or no fibroblastic proliferation or collagen swelling and no Aschoff bodies; there were no vegetations, and the pericarditis and hyaline degeneration of the arterioles were similarly very slight or non-existent. Muscle-cell necrosis, however, was still evident (fig. 4).

As regards the *kidneys*, the non-injected rats (rat 4 of litter I and rats 2 and 5 of litter II) showed pronounced glomerular sclerosis (fig. 6). There was much hyaline degeneration and necrosis of all parts of the tubules, and

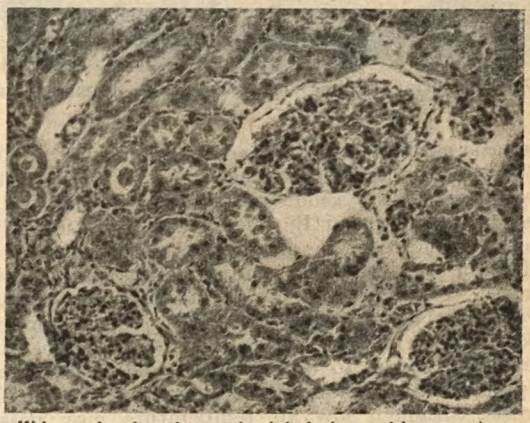

Fig. 5—Kidney, showing glomerular lobulation and increase in number of nuclei in capillaries of glomeruli of rat 4 of litter II (injected only). (×123.)

very large hyaline casts were evident (fig. 6). The walls of the renal arterioles showed pronounced hyaline degeneration. The kidneys of 2 of the 3 injected rats (rats 1 and 2 of litter I) presented the same picture as those of the non-injected rats of group A (fig. 7); the other (rat 3 of litter I) showed some tubular necrosis, although no hyaline degeneration and no hyaline casts were seen.

The lungs of all the rats showed widely disseminated bronchopneumonia. The adrenal cortex of all the rats showed considerable hypertrophy due to hyperplasia in the zona reticulata. This was particularly evident in rat 2 of litter I and rat 2 of litter II.

DISCUSSION

Experiments of group A establish that repeated doses of desoxycortone alone do not produce joint lesions,

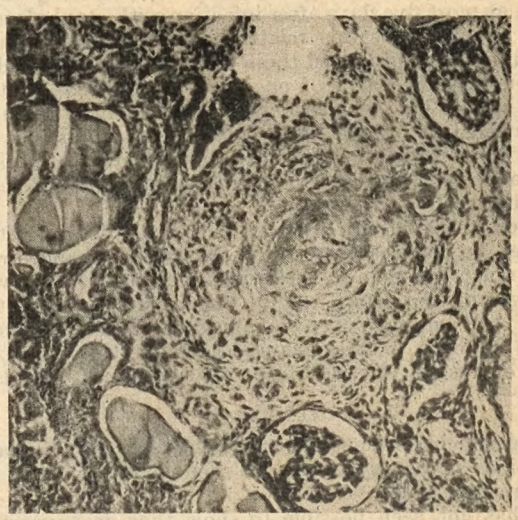

Fig. 6—Kidney showing glomerular sclerosis, large hyaline casts, and hyaline degeneration of renal arterioles in rat 5 of litter II (infected only). (×123.)

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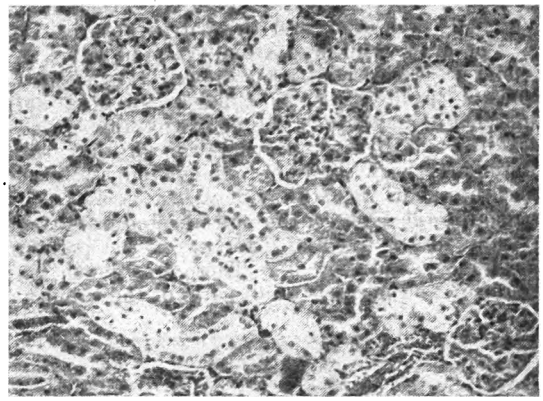

Fig. 7—Kidney of rat 2 of litter I (injected and infected). Note similarity to fig. 5. (×123.)

rheumatic cardiac lesions, or nephrosclerosis in unilaterally nephrectomised rats given saline to drink instead of water and kept at a more or less constant temperature. Experiments of group B suggest that infection, either directly or indirectly, is intimately concerned with the production of rheumatic cardiac lesions and nephrosclerosis. Therefore it is fair to attribute the results of Selye et al. (1944) to the effect of infection either alone or in combination with the factor of low air temperature. There is no reason to minimise the rôle of infection in the production of rheumatic cardiac lesions and nephrosclerosis, although low air temperature may possibly play a part and should be considered in all future researches on this subject.

In the experiments of group B the situation is complicated by the use of low air temperature and two types of bacteria. It was found necessary to use these three factors to produce direct evidence of pneumonia. Thus it is possible that hypersensitivity may play a part, and Rich and Gregory (1943) have shown that it is possible to produce in rabbits rheumatic changes very similar to those described here by inducing serum-protein hypersensitivity. Since, in my experiments, those rats which presented rheumatic changes also had pneumonia, it is interesting that Marine and Baumann (1945) have described that 3 out of 100 rats continuously fed with thiouracil were found to have periarteritis nodosa, and that 2 of these 3 rats had extensive chronic and acute pneumonia.

Since the rheumatic cardiac lesions and the nephrosclerosis were found postmortem in rats of group B only, at most five days after infection with staphylococci, it is possible that this relatively short infection period could not have produced these changes. This is an added reason why the effect of pneumococci and low air temperature should be considered independently in future experiments on these lines, since the pneumococci had had twelve days in which to act, and the low air temperature at least twelve days before these changes were found postmortem.

Those rats of group B which were given desoxycortone showed no nephrosclerosis, and the cardiac changes were very much less than in those rats of group B which were not given the drug. Thus the results suggest that desoxycortone may even be concerned in the resistance of the organism to these changes, although this conclusion rests on results obtained from relatively few animals.

SUMMARY

Experiments designed to study the relation of repeated injections of desoxycortone to rheumatic lesions in the rat are described.

It has not been possible to show that desoxycortone is a factor in the causation of arthritis in rats.

Infection, either directly or indirectly, is intimately concerned with the production of rheumatic cardiac lesions and nephrosclerosis.

Low air temperature may also play a part in the ætiology of nephrosclerosis and rheumatic cardiac lesions, and should be considered in future experiments.

I wish to thank Prof. W. E. Le Gros Clark and Mr. J. S. Weiner for their help and encouragement in this research; Messrs. Organon Laboratories Ltd. for the supply of desoxycortone; Dr. R. L. Vollum for the bacterial suspensions; Mr. E. A. Thompson for technical assistance; and Mr. W. Chesterman for his photomicrographs.

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Reviews of Books

American Pharmacy

Editor-in-chief: RUFUS A. LYMAN, M.D., dean of the College of Pharmacy, University of Nebraska. London: J. B. Lippincott. Pp. 540. 50*s*.

IN this book part I deals with the basic principles of pharmaceutical processes, part II with pharmaceutical preparations, and part III with products of biological origin. Twenty-two contributors, each an expert in his particular field, are responsible for the text. For a book described as "a teaching tool for the specific purpose of better teaching" of pharmacy, too much attention has been given to elementary principles of physics and chemistry. Illustrations of such simple apparatus as pipe-clay triangles, bunsen burners, water-baths, and Liebig's condensers are out of place in a textbook of pharmacy and detract from the excellent standard of the illustrations of the more important pharmaceutical apparatus. The chapter on bacteriological technique is too condensed and not sufficiently clear on the preparation of sterile medicaments, a branch of pharmacy which has expanded considerably in recent years. Pharmaceutical preparations of the *United States Pharmacopœia XII* and of the *National Formulary* are considered in detail, and the section devoted to biologicals, including vitamins, hormones, endocrine glands, vaccines, and sera, is adequate and well illustrated. Unfortunately little is said about penicillin or the other antibiotics, probably owing to delays during publication.

Although the student of British pharmacy would find much of interest in this handsome and carefully edited volume it contains little to assist him in his own qualifying examinations. The appeal to the doctor is also limited because the text sticks closely to the preparations of the *U.S.P. XII* and the *National Formulary*, with their corresponding American nomenclature.

Special or Dental Anatomy and Physiology and Dental Histology

(7th ed.) T. W. WIDDOWSON, L.D.S. R.C.S., consulting dental surgeon, King's College Hospital, London. London: Staples Press. Pp. 472. 42*s*.

THE new edition of this well-known book includes a great deal of new matter. Illustrations are profuse and clear. The section on the development of the teeth and jaws is particularly good, and a special chapter on histological technique has been added. The book is of value to the dental student, but is sufficiently comprehensive to make it worth study by those who have any special interest in the mouth and teeth. It would, however, have been improved by the omission of a multiplicity of older views and theories which now find little support.

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THE LANCET

LONDON: SATURDAY, JUNE 1, 1946

The Nursing Course

THE time required to train a nurse is being considered seriously in many quarters. The Royal College of Nursing hold that a fully qualified nurse cannot be made in less than four years. The actual time required to complete the syllabus for State registration is three years; and in fact many nurses take their final examination when, or soon after, they have completed their third year of training. Many teaching hospitals, however, require the nurse to complete a fourth year, regarding her experience as an unqualified or qualified staff-nurse during that period as essential to her training. Miss EVELYN PEARCE and Miss GLADYS CARTER[1] have reiterated their belief that a thorough practical training in nursing could be given in two years, provided that the student was adequately prepared beforehand and that the course itself was stripped of inessentials. Moreover they have explained how it could be done, and their views repay careful study. A nurse taking a two-year training of the kind they outline would not be considered fit for senior or administrative posts; to qualify for these she would have to take a further course of training containing much more theory, and demanding more intellectual ability. This is the system which, in our view, would give the best results. The practical girl would not be discouraged by intellectual demands which she found it hard to meet, while the girl with intellectual and administrative gifts would be encouraged and expected to develop them to the full.

With a view to improving recruitment the county councils of London and Middlesex have decided to give nurses a complete training within three years of their admission to the wards. If this means that student nurses are to be relieved of all irrelevant duties and allowed to devote themselves to studying the theory and practice of nursing, then the three-year course may well turn out better nurses than the four-year courses offered by many training hospitals today. But in nursing the inertia of tradition weighs heavily against change, and there is a danger that the shortened course may merely deprive the nurse of the responsible experience now gained in the fourth year; it may in fact prove an unsatisfactory half-measure, lowering nursing standards without permanently influencing recruitment.

Other plans for improving recruitment aim at filling the gap between school-leaving age and admission to hospital. Some local authorities already provide pre-nursing courses for girls at this period, and in our own columns in the past few weeks correspondents[2] have advocated an extension of such courses—one of them making the interesting suggestion that a special national service might be founded, akin to the women's Services during the war. Such proposals have their attractions from the point of view of recruitment, but they spring rather from the overwhelming need to get "hands" to run the hospitals than from a regard for the future of the nurse and of nursing. The existing nursing course is already highly specialised and rather narrowing. Pre-nursing courses, we feel, lengthen the nursing course by two years and narrow the interests of the student at 16 instead of at 18. As Dr. MORLEY FLETCHER urges in this issue, the girl would do better to gain education or experience in other directions during those two years. There must of course always be a risk that if she adopts some other occupation she will decide to stick to it; but the fundamental remedy should surely be to make nursing itself into a promising career with prospects that will attract and keep 18-year-olds. Far too much emphasis has been laid on recruitment. Transfusion will not save a patient who is bleeding to death if the torn vessel is left to bleed. Let us rather try to keep some of the 50–60% of nursing students who give up nursing; and let us reduce the need for recruits by employing more trained staff in hospitals. It is said that many of these girls leave nursing because they are not suited to it, not sufficiently educated, or not strong enough to stand the strain. The person who best knows whether a girl is suited to nursing or not is the patient. And he is never asked. For most patients, most of the time, nursing does not mean the more technical feats of the sister—the skilled dressing, the saline-drip, or even the regular careful dosage with medicines. It means having his bed properly made, having his pillows well placed, hearing simple reassuring words at the right moment, getting a hot-water bottle as soon as he wants it, being prepared deftly for operation, being amused and stimulated at one moment, soothed and settled at another. The "born nurse"—the girl who does these things well—is extremely common, just as the maternal instinct is extremely common; and she may not necessarily be good at her books, though she often is. More girls come into hospital with this natural ability to nurse than go out with it. It is destroyed by hurry, by careless criticism, and by emphasis on other and less important aspects of the work.

Here is the paramount reason for making the basic nursing course short, practical, and unhurried. It should be planned to foster and bring to full stature the natural aptitude for nursing. In the test examination at the end of the two-year course it should be possible to find out what her patients think about a candidate. Once a student has proved herself a good nurse she can go on to study the technical and scientific side of her profession without danger of losing the human touch. Nursing should not be a test of stamina. Looking after the sick is heavy work, but need not fall heavily on individuals if properly distributed. Moreover, much of the labour of hospital nursing today is due to obsolete equipment in wards and sluices, and to the equally obsolete belief that a nurse is not working unless she does everything at the double. With proper tools even the depleted nursing staff of our hospitals today could probably do their work calmly and thoroughly. The sick would be the gainers.

1. Reconsideration of Nursing: its Fundamentals, Purpose, and Place in the Community. From the *Nursing Mirror*, Stamford Street, London, S.E.1. Price 6*d*.
2. Findlay, L. *Lancet*, April 20, p. 590. McNee, J. W. *Ibid*, May 18, p. 754.

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The Rise of Endocrinology

THE change which the last ten years have seen in the status of endocrinology is underlined by the almost simultaneous foundation of the section of endocrinology of the Royal Society of Medicine, which came into being on Jan. 25, and the Society for Endocrinology which held its inaugural meeting on April 26. The two societies are complementary and are not in rivalry—even a friendly one. They have several members and even two officers in common. The section of endocrinology, the senior by a short head, has Sir WALTER LANGDON-BROWN, a clinician, as its president and is mainly clinical in its objects, in this conforming with the traditions of the R.S.M. Its objects are to provide a common ground for meeting and discussion and the showing of interesting cases, to arrange joint discussions with other sections of the society, and to bring to the notice of physicians and surgeons the contributions which endocrinology has made to general medicine, surgery, and gynæcology. The stress, in fact, is on education. The object of the Society for Endocrinology, founded by contributors to the *Journal of Endocrinology*, with Mr. S. J. FOLLEY, D.SC., as hon. secretary, is "to promote the advance of endocrinology by observational, experimental, and clinical studies"—in short, research.

With the formation of these two specialist organisations, endocrinology takes its place with neurology, cardiology, pædiatrics, and the rest as a recognised specialty. It differs from many of the specialties however, in having a wider scope. It has no anatomical boundaries, but is concerned with the function of every system of the body. For this reason, the clinical endocrinologist need never be a specialist in the restricted and dangerous sense of the word. Far from knowing more and more about less and less he should always be learning more and more about more and more, and his trend should be to become increasingly a general physician. This truth has for some years been realised by a few hospitals which have welcomed to their staffs general physicians with a special interest in endocrinology and have encouraged them in their studies. But unfortunately the mind of man is limited. And the serious study of endocrinology is a discipline so severe that few are capable of combining it with that of general medicine without one or the other interest suffering. The endocrinologist must be more than a clinician with a slant: he must, as a Peripatetic Correspondent insists, be something of a biologist, something of a biochemist, and everything of a physiologist. It became obvious to a few that in teaching hospitals special departments must be created, controlled by men prepared to give their whole time to the study of their specialty. In two of the London hospitals such clinics came into existence before the late war, though one of the hospitals has since allowed its clinic to lapse. Two hospitals have now appointed endocrinologists, as such, to their honorary staffs, and a professorship in London University has been planned.

The change is welcome. For too long the charlatan and the manufacturer of useless hormones have exploited a field of which the ordinary doctor and even the majority of consulting physicians are woefully ignorant. For many years the few physicians with a real knowledge of the subject have worked in the penumbra cast by their less reputable colleagues, a shadow further deepened by the taboos which still cling to the subject of sex. Credit for the change of view is in part due to the solid contributions to endocrinology of British research-workers and clinicians and in part to the pride with which a few physicians have continued unabashed to wear an equivocal title.

Revolt from the Bedpan

THE designer of the bedpan is presumably long dead. Two things, however, are certain: he had never been a patient and had never met a nurse. His pan has one virtue—thanks to its flat bottom and inward-curving brim it does not easily upset in the bed—but as Dr. DOUGLAS MCCLEAN points out (p. 834) everything else is wrong with it. It is too shallow to contain deodorant; the feeble, the elderly, and the surgical case have to be helped on and off it at the cost of great physical exertion; the weak cannot balance on it, the constipated cannot bear down; the whole ward is offended by the smell; and the patient with a bulky stool endures the sensation described by soldiers as being "jacked off the pan." A not uncommon way to die is from cardiac syncope or pulmonary embolism while on the bedpan.

These drawbacks alone should be enough to condemn it, but in addition a series of objectionable practices surrounds its cleansing. Sluice-rooms, in most British hospitals today, are small and primitive, and methods of washing pans offend against the hygiene standards not only of a hospital but even of the ordinary household. What local authority would countenance lavatory pans which splashed the housewife with dilute fæces? What woman who had later to handle food would care to dip her hands in fæcally contaminated water? The junior nurse often has to accept both experiences. In too many hospitals she brings the soiled pan, covered by a cloth, through the ward and inverts it over a sink fitted with a small spray or jet intended to flush it; the pan is thus rinsed in dilute fæces, and the nurse receives her share of splashes. Rubber gloves are a thing of the future; dipping her hands into the sink, she grasps the contaminated pan and finishes washing it with a mop, taken from a weak solution of lysol, and used repeatedly. After a final rinsing, the pan is left inverted on the draining board—often a wooden one which cannot be properly cleaned or sterilised. The smell from the sink is permanent; the clatter of the pans can be heard in the ward; the nurse washes her hands hurriedly and goes off to the next job—to move or lift patients, to make beds, or cut bread-and-butter. The bedpan is not sterilised before it is given out again; it is not reserved for any one patient; usually bedpans are too scarce to make this precaution possible. Pans are "sterilised" once a day, in the morning, by rinsing in lysol and water; and if the sluice-room is small this rite may be carried out in the patients' bathroom. Urine bottles are rinsed in a similar manner, and the dangers of such a haphazard practice in a general ward need not be detailed. In maternity wards some attempt at hygiene is customary—bedpans are marked or numbered, and a steriliser is provided—but flushing arrangements are often of the crude type described. What follows from these old customs? First, any infective bowel

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organism is liable to be distributed round the ward either by the pans themselves or by the hands and clothing of the nurse; secondly, student nurses who will not tolerate such dirty practices, and possible recruits who revolt from the mere account of them, are lost to nursing. Those who think the disposal of excreta in hospital an unimportant detail should bear these facts in mind.

What alternative methods offer? Good sluice-rooms have been designed and installed in some hospitals; yet there are modern hospitals erected just before the war which have the old ineffectual equipment. In the United States, Canada, South Africa, and a few British hospitals the tipper system is in use. The nurse presses a pedal with her foot, a flap in the wall drops open, she puts the bedpan in, closes the flap, turns a handle, and the pan is flushed with water and sterilised with steam. Some such system must of course become universal, but in the present state of the building industry many years will pass before all our hospitals are so equipped. Short-term measures must be less revolutionary. Clearly there should be enough bedpans in a ward for every patient to have one marked with his name or bed number. Enamel pans, whose chipped and cratered surfaces harbour organisms, should be scrapped in favour of pans made of aluminium or other light metal. These should be designed by anatomists. The Anatomy Department at Oxford was successful in designing a chair for a ship's gunner directing fire at an approaching aircraft: here is an equally difficult but more universal problem which needs solving at once. Besides being easy to clean, the pan should be easy to slip under the helpless patient and so shaped that he is comfortable and able to use the necessary muscles during defæcation. The pan could be lightly filmed with an appropriate deodorant.

Such measures will reduce the objections, but not abolish them. The aim should be to make the use of a bedpan an occasional rather than a routine ordeal. Dr. McCLEAN makes the thoroughly practical suggestion that light metal-framed commodes with movable receptacles could be brought to the bedside. Few surgical patients need complete rest in bed for more than a few days, and many medical patients are up daily; even for the patient with coronary thrombosis moving on to a commode would surely be less risky than wriggling and straining on the bedpan. Paraplegic patients, if able to sit up, find a commode specially helpful, since the action of gravity helps the paretic bowel. The commode receptacle should be made of light metal and should be deep enough to hold some deodorant fluid, which would simplify cleaning besides keeping the ward pleasant. All bedpans and commode receptacles should be boiled immediately after cleansing, and all sluice-rooms should contain a steriliser for this purpose; even a zinc bath on a gas-ring is better than nothing. Wooden fittings in sluice-rooms should be removed without delay, and the sterilised pans should be placed in a metal rack till needed. These racks might carry hot pipes, so that the pans are always warmed and ready; at present nurses warm them with hot water before giving them out. Another plan would be to distribute pans from a heated trolley. They should certainly be collected on a trolley with shelves and doors; there can be no good reason why patients should have to watch nurses running through the ward, pan in hand, or why the nurse should have to make twenty journeys to the sluice when one would suffice. The cleansing of pans without proper equipment presents a much more serious problem—an example of the need for nursing research. Scientifically minded matrons and sisters, in collaboration with surgeons and bacteriologists, must devise a non-touch technique which can be taught to junior nurses. Properly taught this should give the student nurse an insight into aseptic technique which will stand her in good stead throughout her training, besides turning a nauseating job into a piece of technical virtuosity. We should welcome suggestions.

Annotations

THE INTERNATIONAL OFFICE OF PUBLIC HEALTH

THE first meeting of the permanent committee of the Office International d'Hygiène Publique since April, 1939, was held in Paris from April 24 to May 2. Considering the unsettled political state of the world, the difficulties of travel, and the threat of absorption by the new World Health Organisation, an attendance of delegates from about 40 member countries—out of 59—and the presentation of some 20 communications on medical and quarantine subjects was highly creditable, although a number of countries were represented by diplomats rather than doctors and Russia was again conspicuously absent. At the first session, Dr. M. T. Morgan (representing the British colonies outside Africa) was unanimously elected president on the proposal of Surgeon General Hugh Cumming (U.S.A.), who had been acting as president ad interim.

Perhaps the most important work of the meeting was that of its legal commission, under the chairmanship of Dr. M. Gaud (Morocco), which produced a report setting out the juridical status of the Paris Office and the international sanitary conventions, in the light of the resolution of the Economic and Social Council and the recommendations of the preparatory committee of experts,[1] and discussing the legal and technical difficulties which might arise through the consequent absorption of the Paris Office. It seems clear that, legally, the Office must continue to function indefinitely for any member countries who do not agree to its termination or absorption, and it is thus likely that there must be a period during which two international health organisations will exist, since it may be some time before all countries, including the neutrals, are sufficiently assured that their quarantine interests will be adequately safeguarded by the new World Health Organisation. In that case it is important that a working agreement be concluded between the W.H.O. and the Paris Office, similar to that now operating successfully between the Paris Office and UNRRA. If, however, virtually unanimous agreement can be obtained, there are four possible solutions (1) the Paris Office could be dissolved and its functions transferred to the W.H.O.; (2) it might itself be transformed into the W.H.O.; (3) it might be absorbed into the W.H.O. as a functional quarantine office for the application of the international sanitary conventions; or (4) it might be absorbed as a regional office. The last proposal seems to have been most in favour with the experts of the preparatory committee, but there is perhaps even more to be said for the third, since the Paris Office would then carry on the work for which it was designed and which it has performed so successfully in the past.

The quarantine commission, presided over by Dr. P. G. Stock (United Kingdom), noted with satisfaction

1. See *Lancet*, April 20, p. 577.

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that the Mecca pilgrimage had again been free from epidemic disease and decided to defer for further consideration the request of the Egyptian delegate to revise the pilgrimage clauses of the 1926 convention. Discussions were also held on the surveillance of air passengers, the so-called "immunity reaction" to smallpox vaccination, and the great value of dried lymph in hot countries. Noteworthy among the general contributions were papers on tuberculosis in Denmark and France, by Prof. Th. Madsen and Dr. E. Aujaleu; on an epidemic of smallpox in Arras, by Prof. A. Lemierre; and on the control of transmissible diseases in the British colonies during the war, by Dr. W. H. Kauntze. Finally the finance commission reviewed the financial position of the Office, which seems to have met its obligations adequately during the war years despite the lapse of contributions. Indeed the health and vigour generally shown by this prospective corpse proved quite remarkable.

THE COMMON COLD

THE study of several important human diseases has been hampered because the infection cannot be transmitted to laboratory animals or because its effect on animals is quite different from its effects on man. This is true especially of viruses. The discovery that influenza could be transmitted to ferrets [1] was a big step forward, and the story of the ferret, nearly 200th in the chain of infection, which gave a man influenza by sneezing in his face has passed into the history of bacteriology. Unhappily the only animal so far found to contract the common cold is the chimpanzee, which is unsuitable for tests on a large scale. For the new investigation which begins in July volunteers will therefore be used. The work will be done by a common-cold research unit established by the Medical Research Council and the Ministry of Health at the Harvard Hospital, near Salisbury, which was built and equipped in 1941 and was given to the Ministry by Harvard University and the American Red Cross for research into communicable diseases. Volunteers from the universities, who will be isolated in pairs, will have their noses sprayed with material to test for the presence of the virus. Organised observations of this kind have been going on for many years [2] and it is high time that whatever outstanding questions they can answer were answered definitely. Conclusive experiments necessitate rigorous quarantine, but every effort will be made to mitigate the irksomeness of isolation, and there will be no lack of volunteers for any serious attempt at investigating one of the major afflictions of these islands. The unit will make new efforts to find a susceptible animal " or, better still, some other laboratory technique which will permit a scientific approach to the problem."

PREDIGESTED PROTEIN

THE importance of enough protein in the diet, both for maintaining health and for speeding recovery from disease, has been emphasised by the present world shortage of food. In the care of sick infants pædiatricians have long been faced with the dilemma of choosing between the risks of food intolerance and those of starvation, while physicians responsible for older patients now recognise the dangers of former "light" diets, which were often insufficient to keep the body in nitrogen balance. Predigested protein is now increasingly used to provide easily assimilable nourishment for those who cannot tolerate ordinary food: after hydrolysis most of the protein is reduced to amino-acids which are soluble in water. The main objection to these products is their bitter taste, which is unpalatable to all humans, other than premature or very young babies. There are, however, ways of disguising this flavour, and these may be expected to improve.

The raw material has usually been the casein of cows' milk or raw beef, but Dormer [1] in South Africa announces a proposal to prepare protein digests on a large scale from whale flesh, a substance not at present used for human consumption. Concentrates are made up in two forms, both of which are reported to be stable; the first is a water-soluble syrup or powder containing mostly amino-acids, and the second an insoluble powder containing amino-acids, polypeptides, and peptones. It is said that the products can be processed without difficulty on shore or at sea, and that the cost of production will probably be a quarter that of concentrates from other sources. Chemical analysis is proceeding, and successful clinical trials have already been made. Protein biscuits might, it is suggested, be issued to school-children in areas where the diet is deficient; and the concentrate, which lends itself to easy transportation and protracted storage, might be kept in depots throughout the world as a reserve against times of war and famine.

THE DOCTOR'S DISEASE?

THE Registrar-General's Decennial Supplement for 1931 was largely responsible for the widespread belief that doctors are more liable to coronary thrombosis than any other section of the community; the death-rate from coronary disease and angina pectoris among 25,000 physicians and surgeons was found to be 3·68 times the average for all occupations. In 1941, Willius, a distinguished American cardiologist,[2] expressed the view that "the cardiac death-rate among physicians today is appalling." This Anglo-American shroud of gloom was rudely rent by Hope Gosse,[3] who not only indicated anomalies in both the Registrar-General's returns and the American figures but also produced new figures of his own contradicting the claim that doctors were particularly liable to coronary thrombosis. He pointed out that during the period covered by the Registrar-General's returns the diagnosis of coronary thrombosis was not yet in general use in this country, the condition probably often being certified as myocardial degeneration. A fairer comparison, he maintained, was to take the total of deaths due to "heart diseases," which showed that physicians and surgeons had a mortality 1·38 times that of the average for the community. Willius's figures were based on those deaths, reported in the *Journal of the American Medical Association*, in which the cause of death was stated. Since this was not stated in all cases, the statistical value of the figures was doubtful. As part of an analysis of morbidity and mortality among 8884 medical men between the ages of thirty and sixty-five, Hope Gosse found that among 100 consecutive deaths only 27 were due to cardiovascular causes. He summed up the position in Great Britain as being that 1 doctor in 4 dies before he reaches the age of sixty-five; 1 in 40 dies from coronary thrombosis; and less than 1 in 10 up to sixty-five years of age dies from cardiovascular and cerebrovascular degeneration, including coronary thrombosis.

This comforting conclusion is now supported by American workers.[4] Working on the principle that, if the age at death from a particular disease is distinctly lower in one occupational group than in the general population the occupation must play a part in the ætiology of the disease, they have compared the average age at death from coronary-artery disease among doctors and among the general population. In two different series (215 and 253 cases) of doctors dying of coronary-artery disease the average age at death was 66·0 and 65·8

1. Smith, W., Andrewes, C. H., Laidlaw, P. P. *Lancet*, 1933, ii, 66.
2. E.g., Dochez, A. R., Mills, K. C., Kneeland, Y. *Ibid*, 1931, ii, 547.

1. Dormer, B. A. *Report to the Red Cross Society, Natal, on an Experiment with Predigested Protein.*
2. Willius, F. A. *Proc. Mayo Clin.* 1941, **16**, 714.
3. Gosse, A. H. *Brit. med. J.* 1942, ii, 567.
4. Levine, S. A., Hindle, J. A. *New Engl. J. Med.* 1945, **233**, 657.

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years, and the latter figure is exactly the same as the age at death in 445 cases among laymen seen in consulting practice by White and his colleagues.[5] So if we find our attention wandering to our chances of sudden death we may hang the following quotation from Levine's article as a text on our consulting-room wall: "*The life of a physician is not conducive to coronary artery disease.*"

DIABETIC DIARRHŒA

RECENT work [6 7] has suggested that the neuropathy of diabetes mellitus involves not only the peripheral nerves but also the central and autonomic nervous systems. Sheridan and Bailey [8] cite the diarrhœa of diabetes as a possible manifestation of such a neuropathy. The striking feature of this diarrhœa, which was observed in 40 patients, is its nocturnal incidence; patients had anything up to eight stools at night, sometimes with incontinence during sleep, but no trouble during the day. In each case the stools were watery, and there was nothing to suggest pancreatic deficiency. Another feature of the condition is the tendency to spontaneous remissions.

The age of patients in this series ranged from 20 to 79 years, with an average of 42; and the average duration of diabetes was 9 years. In every case there was evidence that the diabetes had been incompletely controlled before the onset of diarrhœa. Of 29 patients in whom gastric analysis was performed, complete achlorhydria was found in 14. Of the 28 patients to whom a barium enema was given, 6 showed spasticity of the colon. The blood-picture was essentially normal. An interesting finding was a total protein above 100 mg. in 6 of the 18 patients whose cerebrospinal fluid was examined. Diabetic retinitis was found in a third of the 33 patients submitted to ophthalmic examination. It is these last two findings, in conjunction with the presence, before the onset of diarrhœa, of diabetic neuritis in more than half the patients, that suggest the neuropathic origin. Sheridan and Bailey postulate that the diarrhœa may be due to disturbance of the sympathetic innervation of the colon. Apart from treatment of the diabetes, the most effective therapy was found to be crude liver extract, which controlled the diarrhœa in 26 out of 28 patients; this was given in doses of 2–4 c.cm. intramuscularly every day for 4–6 days, followed by weekly injections. While the tendency to spontaneous remissions makes it difficult to assess the effect of any form of treatment, this response supports the hypothesis that the condition may be part and parcel of a neuropathy. But it would be instructive to learn whether folic acid is equally effective.

HEALTH BY TELEVISION

THERE are many ways of spreading health information. The Bureau of Health Education in the United States is exploring a new one by organising a series of "telecasts" on such topics as the evolution of the stethoscope, the medical uses of X-rays, the basal metabolic rate, blood examinations, contagious disease precautions in the home, and methods of administering drugs. With the return of television to this country on the eve of V-day, June 8 next, it will be open to us to consider the value of this method, though there is little hope of its reaching any great number of the public for some time, owing to the cost of sets and the limited range of reception.

Television can distribute practical instruction with a clarity and precision that are unattainable by the spoken word alone; and the addition of vision may serve to sustain interest in topics which hold no great appeal on the radio. Information must be directed mainly at those who are ignorant and/or uninterested in questions of health; and the criteria in the selection of subjects should thus be simplicity, usefulness, and interest, though an occasional boost could be given to a series by concentrating on interest to the detriment of utility. The first demonstration in the American series, on the nutritional values of foods, is one particularly suited to this medium. First-aid, infant welfare, and, of course, physical training are other possible subjects that come to mind. But the value of television will be not so much in systematic education as in the stimulation of interest, that is, in propaganda by example: a demonstration of bathing the baby will have fulfilled its purpose if it attracts fresh comers to the infant-welfare centre.

The day is long past when the doctor sought, or was granted, a veil of mystery in which to invest his calling. But this does not absolve the profession from its duty of protesting against the irresponsible presentation of medical subjects to an unselected audience of laymen. For example, the American series includes a blood-pressure demonstration. Will this not encourage neurotics to purchase their own sphygmomanometers or to plague their doctors for readings? Knowledge by the layman of isolated medical facts will always be encompassed by danger. The B.B.C. has shown an admirable restraint in its selection of medical broadcasts, and it will no doubt exercise still greater care in exploiting the new medium.

BETTER WHEAT

WITH the prospect of a world shortage of wheat continuing for some years we must not only grow as much wheat as possible in this country but must grow wheat of the highest possible quality. The conference on the post-war loaf last year [1] reported that home-grown wheat was usually, though not always, poorer in nutrients than imported Canadian wheat. This view was not supported in the report by actual figures, but Mr. T. Moran, D.SC., of the Ministry of Food Cereals Research Station, has now supplied more precise data on this important point.[2] The following figures for protein and the three accessory nutrients for which a minimum requirement was recommended by the conference were obtained on nos. 1 and 2 Manitoba wheats imported in the summer of 1943 and an average of 32 samples, covering 19 varieties, of wheat grown in different parts of England in 1943.

	Manitoba	*English*
Protein (%)	13·62	8·89
Vitamin B_1 (I.U. per g.) ..	1·18	0·96
Nicotinic acid (μg. per g.) ..	55·0	48·0
Iron (mg. per 100 g.)	3·81	3·05

The differences throughout are striking, and well substantiate the conference statement. Dr. Moran notes, however, that the view that English wheats are regularly lower in B_1 content than Manitoba wheats rests on results from an insufficient number of successive harvests and requires further investigation. Nevertheless, he points out that though in general there is no significant correlation between protein content and B_1 content of different varieties in the same season, there does appear to be such a correlation between the *average* B_1 content and the *average* protein content of the English crop from one year to another, and the protein content of home-grown wheats is commonly appreciably lower than that of imported.

Bound up with the apparently genuine lower nutritional value of home-grown wheats is the well-known poorer bread-making quality of English flour. It is clear therefore that the conference was well justified

5. White, P. D., Bland, E. F., Miskall, E. W. *J. Amer. med. Ass.* 1943, **123**, 801.
6. Rundles, R. W. *Medicine*, 1945, **24**, 111.
7. Rudy, A., Epstein, S. H. *J. clin. Endocrin.* 1945, **5**, 92.
8. Sheridan, E. P., Bailey, C. C. *J. Amer. med. Ass.* 1946, **130**, 632.

1. Cmd. 6701. H.M. Stationery Office, 1945.
2. Moran, T., Jones, C. R. *Nature, Lond.* May 18, 1946, p. 643.

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in recommending research to determine which varieties of English wheat "will produce flour (*a*) of good bread-making quality, and (*b*) containing the maximum proportion of the desired nutrients without appreciable loss of yield on average soils." They further recommended that our farmers should be encouraged to use such varieties. This selection of the best varieties is a sound preliminary measure, but research should be carried further than that. Sir Rowland Biffen showed many years ago how, by controlled breeding, to combine quality and yield in wheat with resistance to disease. A research programme on wheat-breeding should be drawn up to produce new varieties of wheat suitable for our soils and climate which will combine the two factors of bread-making quality and high nutrient content. The work would have to be done at several coördinated centres, such as Rothamsted, the National Institute of Agricultural Botany, and the Cereals Research Station. It would take many years to bring the research to successful fruition; but the investigation should be undertaken, and its inception should not be delayed if wheat-growing is to remain a corner-stone of agricultural policy in this country.

EMPIRE MEETING

THE Empire Scientific Conference arranged by the Royal Society is to be opened by the King on June 17 in London, but some of the later meetings will be held in Cambridge and Oxford. Among the subjects on the agenda are the ætiology and control of infectious and transmissible diseases, particularly those which are insect-borne (Cambridge, June 28); physiological and psychological factors affecting human life and work under tropical conditions and in industry (Oxford, July 1); and the science of nutrition (Oxford, July 3). General subjects include methods of improving the interchange of scientists throughout the Empire; scientific organisation; measures to secure greater uniformity in physical standards of measurement and the use of units, terms, and symbols; a scientific information service (for scientists); and Empire coöperation with international organisations.

The topic that may rouse the greatest public interest is the dissemination of scientific news to the public generally, which will be discussed in London on the last day of the conference, July 8. Many have felt for some time that the public's desire for accurate information of scientific progress should be met by the establishment of a scientific news agency.

200 YEARS OLD

THE Middlesex Hospital's bicentenary celebrations last week were a happy mixture of the formal and the friendly. On three afternoons the president and the chairman of the hospital received guests at tea in the board-room before a lecture. On Monday Sir Robert Robinson, P.R.S., spoke on Chemistry and Medicine, contrasting the biologist's tendency to more and more detailed analysis with the chemist's attempts at more and more complex synthesis. On Wednesday Sir Edward Mellanby, F.R.S., introduced by Sir Alfred Webb-Johnson, P.R.C.S., considered the Future of the Medical Sciences; and on Thursday, Sir Lionel Whitby, in an address on The Middlesex and Medicine, brought some of the great dead to life. On this occasion Colonel J. J. Astor, as chairman of the board, read a message from Prof. Elliott C. Cutler conveying affectionate greetings from the Harvard Medical School, and his own reply looking forward to ever-increasing coöperation with the United States. Since an Earl of Northumberland was chosen as president of the hospital 200 years ago his successors have always been presidents of the hospital; and the new Duke, in thanking Sir Lionel Whitby for his address, was able to add his tribute to medicine as one fresh from the battlefield.

On Saturday afternoon and evening between two and three thousand subscribers, helpers, and friends of the hospital attended an exhibition of its work. The exhibits included the synthesis of stilbœstrol, models of micro-organisms 50,000 times their natural size, the electro-encephalograph, and films. Short services of thanksgiving were held in the chapel.

FUNCTIONS OF THE G.M.C.

A COMMITTEE of the General Medical Council has been preparing a draft Bill for consolidating and amending the Medical Acts. Sir Herbert Eason, the president, told the council on Tuesday that the pressure on parliamentary time makes it unlikely that a comprehensive Bill of this kind could be introduced "within any period which can now be foreseen." Accordingly the committee has prepared the draft of a short Bill including only those provisions for amendment which it deems urgent. The recommendations, said the president, involve not only the constitution of the council but their powers; and it is significant that in a previous passage he recalled proposals to the Ministry of Health in 1943 and to the Privy Council in 1944 "that legislation should empower the council to form and maintain a register of specialists, and to make regulations for prescribing the manner in which applications for admission to the register should be made."

KEEPING QUALITIES OF PENICILLIN

THERE is some confusion about the loss of potency in penicillin during storage. Its stability varies widely according to the preparation being used. Solutions for injection should be used within 48 hours of preparation and even so should be kept at a temperature not exceeding 40° F during this period. Aqueous preparations such as creams must be stored in a refrigerator, but when taken out will remain effective for about a week if kept in a cool place. Penicillin in the powder form in which it is usually supplied in bulk can be stored for a year in cool dry conditions, such as a dry cellar, if the temperature does not exceed 60° F. Anhydrous preparations, such as lozenges and ointments with a greasy base, may be kept in the same way. Thus the doctor who has no refrigerator can keep a supply of penicillin powder in rubber-capped vials or ampoules for injection, ointments for local application, and lozenges for treating mouth and throat infections.

THE NEW WELLCOME CHAIR

THE University of London has accepted an offer from the trustees of the estate of the late Sir Henry Wellcome of a capital sum of £74,000 for the endowment of the chair of pharmacology at the College of the Pharmaceutical Society, now occupied by Dr. G. A. H. Buttle, which will henceforth be called the Wellcome chair. Since its foundation in 1936 the department of pharmacology at the college has made important contributions to research and teaching.

ABOUT 2000 people are expected to attend the Royal Sanitary Institute's health congress at Blackpool on June 3–7. Among the subjects to be discussed are the social pathology of rheumatic fever, the future place of the special hospital, the care of children away from their parents, the future of pædiatrics, the care of the aged in health and sickness, and housing and slum clearance.

Dr. Adrianus Pijper and Miss Freda Troup have compiled a life of the late Dr. J. MacD. Troup, of Pretoria (see *Lancet*, 1945, ii, 514), for private circulation. The biography, which is entitled *Physician and Friend*, is being published by subscription at 30*s*. a copy. After expenses have been met the profits will be divided between the South African Medical Benevolent Fund and King's College Hospital, of which Dr. Troup was a student and a governor. Those wanting copies are asked to write as soon as possible to the authors, at Box 5783, Johannesburg, South Africa.

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Special Articles

GENERAL MEDICAL COUNCIL

ELECTION OF DIRECT REPRESENTATIVES

LAST Tuesday voting papers were sent to all medical practitioners registered as residing in England. Five vacancies on the General Medical Council are to be filled by direct representatives of the medical profession in England, and there are thirteen candidates to choose from.

NOMINEES OF BRITISH MEDICAL ASSOCIATION

The five retiring representatives offer themselves for re-election, and their candidature is endorsed by the divisions of the British Medical Association. They are:

Dr. J. W. BONE, member of the council since 1928 and treasurer since 1939. Treasurer of the B.M.A.

Dr. H. GUY DAIN, F.R.C.S., member of the council since 1934. Chairman of council of the B.M.A.

Dr. E. A. GREGG, member of the council since 1942. Chairman of the Insurance Acts Committee.

Sir KAYE LE FLEMING, member of the council since 1928. Former chairman of council of the B.M.A.

Dr. N. E. WATERFIELD, F.R.C.S., member of the council since 1945. Chairman of the central ethical committee of the B.M.A.

They hold that in present circumstances the best qualifications a direct representative can have are a long and wide experience of practice and a sound knowledge of professional problems. He must be able to express with full authority the views of the general body of practitioners.

"We believe, and events in recent years have shown, that many reforms are needed in the constitution, functions and procedure of the General Medical Council, and we submit that our experience will enable us, if elected, to make a useful contribution from within the body of the council itself to the discussions that are now taking place. Although the National Health Service Bill does not mention the General Medical Council, it is possible that the status and disciplinary functions of the latter may be involved, and it would be of considerable advantage to the profession if the direct representatives were men whose activity in connexion with the Bill itself had given them a thorough understanding of its proposals and implications. All of us have taken a very keen and active part in the matters affecting medical education, and three of us are at present members of the special committee of the B.M.A. which is making a thorough re-examination of the curriculum with a view to recommending badly-needed reforms. If we are elected to the General Medical Council, we shall continue to press for such revision as will bring medical education into closer correspondence with the progress of knowledge and the requirements of modern practice."

NOMINEES OF MEDICAL PRACTITIONERS' UNION

Five candidates also are put forward by the Medical Practitioners' Union:

Dr. A. J. CLARKE, vice-chairman of the London Panel Committee.

Dr. WM. FRASER, of Carlisle.

Dr. L. W. HEFFERMAN, F.R.C.S., president of the M.P.U.

Dr. J. E. OUTHWAITE, of Leeds, barrister-at-law.

Dr. GORDON WARD, of Sevenoaks.

These open their address by saying that the constitution of the General Medical Council was laid down almost 100 years ago and is quite out of keeping with modern ideas. In the opinion of the M.P.U.:

(1) The present procedure of the council in penal cases, depending on hearsay evidence, is unjust and should be radically reformed. (2) The constitution of the council should be altered so as to include a much higher proportion of directly elected representatives (at present only 7 members out of 42 are so elected). (3) There is a risk that the council may become a mere department of the Ministry of Health. It must remain an independent body. (4) No man should be deprived of his means of livelihood without the fullest possible right of appeal to the courts. (5) The best plan is reform of the General Medical Council from within. It should itself decide what alterations are required, and should make the necessary recommendations to the Government.

INDEPENDENT CANDIDATES

Dr. WILLIAM MACLEOD, of Consett, co. Durham, is a general practitioner, aged 34, with six years' war service as a regimental and unit officer and as an administrative officer.

"I believe," he says, "that the constitution and functions of the General Medical Council require revision. I feel, as a young man, not without a varied experience, that I could contribute to this reform. I believe that medical education requires readjustment, and believe that I have a contribution to make in the matter of medical curricula and examinations. In the present times of flux, and uncertainty of the future, I feel that the younger generation of medical practitioners should be represented on the supreme body of the profession and have a voice in the possible destiny of present and future generations of doctors."

Dr. L. F. BECCLE, of South Woodford, London, is 43 and qualified in 1924. He writes:

In common with a large number of other doctors I have viewed the penal procedure of the G.M.C. in recent years with considerable misgiving. It is quite obvious that the rules of procedure require drastic revision, and further that the right of appeal to a legal tribunal should be instituted.

My claim to membership is best illustrated by a brief review of my career. After qualifying I spent five years in general medical practice, which gave me complete insight into the rights, duties, and functions of the general practitioner. I was called to the bar in 1933 and after a period of study in the chambers of Treasury counsel I became a member of the Central Criminal Court bar and of the south-eastern circuit. Whilst engaged in legal practice I was appointed coroner for the southern district of Essex in 1936, an appointment which I still hold. I have had 13 years of legal experience, and in the course of my duties I have acquired an intimate knowledge of the difficulties which beset the practising doctor.

I feel that my unusually extensive medical and legal experience more than justifies my election to the G.M.C., and being free from the anxieties of competitive practice I am in a position to devote as much time as is necessary to the duties involved. I therefore ask for the support of all doctors who feel that a small transfusion of fresh blood will improve the quality of the council, and I take this opportunity of stating that I have not approached the B.M.A. to support my candidature, and that I am not one of the official B.M.A. nominees. These were chosen before I entered the lists. I have, however, been a member of the B.M.A. for approximately 20 years.

The following letter from Sutton, Surrey, supports the candidature of Dr. W. W. SARGANT:

There is a large and growing body of opinion which feels there should be at least one direct representative on the General Medical Council whose age is not over 45. At the present time, when so many are returning to civilian work after years in the Forces, this criticism of the past age composition of the council is finding expression. We have, therefore, at short notice and without the resources which the medical organisations have at their command, decided to nominate Dr. William Walters Sargant, M.R.C.P., as an independent candidate.

Dr. Sargant, who is 39, has had 15 years' experience of full-time work in voluntary and municipal hospitals. He has held a Rockefeller fellowship, and is a member of the council of the Royal Medico-Psychological Association and of the psychological medicine committee of the Royal College of Physicians. He was throughout the war, and still is, a psychiatric specialist in the Emergency Medical Service.

We feel sure that Dr. Sargant's candidature will be supported by all those who feel that gerontocracy is not enough and that the views of the younger members of

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the profession, in whose hands the future development of medicine lies, should be represented on the General Medical Council. If he is elected, we are confident that he will remain independent, without political ties, and with no purely sectional interest except to voice the views of the younger doctor.

H. J. SHORVON	HELEN BAKER
N. CRASKE	A. R. SAMUEL
C. ANDERSON	E. A. BURKITT
BARBARA DANIELL	G. R. DEBENHAM
M. N. PAI	D. E. BUNBURY
P. H. MEEHAN	R. H. SANDIFORD
M. S. JONES	A. BARLOW
T. M. LING	

President's Address

Opening the 168th session on Tuesday last Sir HERBERT EASON, the president, began by speaking with deep regret of the death of Sir Farquhar Buzzard, long a distinguished member of the council. Recent changes included the retirement of Prof. E. P. Cathcart, who represented the University of Glasgow from 1933, and by his humanity of outlook and sense of humour endeared himself to all his colleagues; Prof. C. G. Lowry, who, representing the Queen's University of Belfast from 1938 to 1941, and the Crown from 1941 until last January, contributed clear-headed comments on all subjects connected with the curriculum, and also valuable special knowledge of obstetrics and gynæcology; and Mr. Myles Keogh, of the Apothecaries' Hall of Ireland, who "brought to the council that genial outlook and that knowledge of human nature which we are accustomed to expect from representatives of his ancient corporation." He welcomed in their place Prof. G. M. Wishart (Glasgow), Dr. James Boyd (chief medical officer for Northern Ireland), and Mr. J. C. Flood, returning to the council after an interval of retirement.

Turning to the National Health Service Bill, the president expressed his satisfaction that the teaching hospitals, which are inseparable from the medical schools as part of the educational structure of the profession of medicine, are to be given a great measure of freedom, both financial and administrative. The council, he said, have always upheld the principle that the medical schools and the licensing bodies should have the widest discretion in innovation and experiment.

The Bill also recognised that in future there will have to be a service of consultants or specialists.

"The council have always held the view that if, in any State service, consultants or specialists are to be paid out of public funds, it is essential that proper provision should be made both for the efficiency of their education and for the proper registration of their qualifications. The council will remember that in February, 1944, the Minister of Health then in office stated that if at a later date it were thought desirable that consultant and specialist appointments should be restricted to persons qualified in some particular manner and enrolled on a list for the purpose, it would be necessary to provide for the establishment of a register on a statutory basis in a manner approved by Parliament. The council in 1943 sent a deputation to the Minister on this subject, and in 1944 represented to the Privy Council that legislation should empower the council to form and maintain a register of specialists, and to make regulations for prescribing the manner in which applications for admission to the register should be made."

At this session of the council the education and examination committees would be submitting draft recommendations as to (1) general and premedical education, (2) professional education, and (3) professional examinations. If these were approved by the council they would then be submitted to the licensing bodies for their observations; and it was hoped that the final recommendations of the council, both as to the curriculum and as to professional examinations, would be published at the end of the November session.

"I do not think that I am unduly anticipating the decision of the council when I say that I think they will endorse the view that a period of less than five years is not adequate to enable a student to acquire that knowledge which in the words of the Medical Act, 1886, 'guarantees the possession of the knowledge and skill requisite for the efficient practice of medicine, surgery, and midwifery'; and further, that before a person who has obtained a medical diploma is entitled to be finally registered for practice, he should be required by legislation to have held approved appointments for a period of twelve months."

In order to provide for this and other developments in medical education, and to bring the Medical Acts more closely into conformity with modern requirements, the council in November, 1944, appointed a committee on the consolidation and amendment of the Medical Acts. This committee had reached the stage of producing a draft Bill which was printed in order to enable the council to be ready with suggestions for the consideration of the Government and their expert advisers.

"Such a draft Bill is of necessity lengthy, and it appears quite clear to the committee that with the pressure on Parliamentary time there is no prospect of securing the introduction into Parliament of such a comprehensive measure to consolidate and amend the Acts within any period which can now be foreseen. The committee are therefore submitting to the council at this session a short draft Bill which includes those provisions, and only those provisions, for the amendment of the Medical Acts which the committee think may reasonably be regarded as urgent. The recommendations involve not only the constitution of the council but their powers, and the legislative sanction which will be required in order to institute an interim period between the passing of a qualifying examination and the registration of a practitioner, should Parliament see fit to approve the recommendation which the council supported in their evidence before the Inter-Departmental Committee on Medical Schools."

THE BILL

VIEWS OF THE M.O.H.

THE Society of Medical Officers of Health have issued a statement which welcomes the National Health Service Bill as providing a health service for every person in the country and particularly approves the proposals for the mental-health services as a step towards unification. The society feel, however, that this ultimate objective could have been furthered even in present circumstances had the Bill proposed that the industrial and school health service should become the responsibility of the local health authorities in their areas. They hope that arrangements will be made whereby the M.O.H. can secure returns of all morbidity and disability in his area so that the incidence of these conditions may be studied and measures introduced for their reduction and prevention.

The society trust that machinery will be provided for the working together of the three main bodies responsible for local administration of the service—namely, the regional hospital boards, the local health authorities, and the local executive councils. They think that it may be possible to secure some degree of coördination by regulations or otherwise enabling medical officers of health of major local authorities to be directly linked with every board, committee, or other body administering any part of the health services in local-government areas.

Certain parts of the service, however, require even closer coördination than the above provisions would be likely to secure. Discussing tuberculosis, venereal diseases, and maternity, the society argue that the clinic services, including frequent home visiting, contact supervision, and care work of all kinds for the above-mentioned conditions are so closely associated with the established work of local health authorities that they should continue to be the function of such authorities. Further means

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by which the necessary coöperation between the bodies administering the various elements of the services could be secured include: (i) the utilisation of the medical staff of hospitals in the clinics to ensure continuity of treatment; and (ii) the placing of all almoning services, as well as the health visiting and home nursing services, under the local health authorities.

The society welcome the proposals in the Bill for establishing a hospital service in regional areas and feel sure that this will ultimately produce a hospital service second to none. "It is not easy to see, however, in what way the influence of the hospital service will pervade the general practitioners' services nor how the curative services will be linked up with the health services of the local health authorities for the prevention of disease and the maintenance of health." The recommendations made above, and particularly the proposal that the hospital almoner, while working within the hospital, should be an officer of the local health authority, would go a long way to meet the difficulty.

The society do not altogether favour the proposal that there shall be only some 16 or 20 regions. They regard this number as too small and likely to deprive the hospitals of the stimulus of local interest and the M.O.H. of the easy contacts which are so important to the smooth working of the service. Among other suggestions made are the following:

(1) That of the 15 medical practitioners to be appointed to the Central Health Advisory Council at least one shall be a M.O.H.
(2) That the chief executive officer of a regional hospitals board shall be a registered medical practitioner with extensive administrative experience.
(3) That delegation of the health services to be provided by local health authorities be permitted in respect of any or all such services to any suitable local authority including a metropolitan borough within the area.
(4) The total prohibition of money payments should not preclude financial assistance for certain specific objects which is at present available to patients—e.g., suffering from tuberculosis—and their families from the voluntary funds of existing care committees and which cannot now be legally met out of rate-provided funds.

The statement also discusses the problem of compensation. It is published in full in the May issue of *Public Health*.

Towards Social Security

The Self-employed

THE economic spur which stimulates most employed persons to resume their normal employment does not affect certain of the self-employed, whose earnings may for a time run on by the exertions of other people. The Beveridge report suggested that the only form of sickness insurance the self-employed require is of a long-term character, and proposed that no benefit should be paid them for the first 13 weeks of incapacity. This raised criticism, and by way of concession the white-paper issued by the Coalition Government gave benefit after the first 4 weeks. The National Insurance Bill introduced last autumn followed the same line of principle and for the same reasons. Considerable public feeling was aroused, however, especially as the self-employed thought they were paying more contributions for less benefits. In consequence, the present Government have made a further substantial concession, by which the self-employed will receive benefit from the 4th day of incapacity in the same way as those persons who are employed. (If within 13 weeks of those 3 days there are 9 further days of sickness or unemployment, then even those 3 days are payable.) For this concession an additional contribution is of course required, and this has been fixed at 5*d*.

The problem now arising, for the administrators and also for the medical profession, is that of testing incapacity. A person who is away from the factory and therefore unable to attend to his machine is clearly not performing remunerative work and this fact can be ascertained quite readily. But the shopkeeper, especially if living over his workplace, is in a different situation, and it will not be easy to draw the dividing line between the time he is actually working and the time he is not working. There are many cases which decide themselves when the illness is severe; but in the borderline cases—especially during the first 24 days now conceded—difficulties are sure to arise, and it is to be hoped that in making this concession the Government have decided how they are to be overcome.

Standing Orders

In these days of planning, no undertaking of any consequence can expect to survive without some form of written code concerning its internal arrangements. The type of body which is apt to complain most of the difficulty of statutes, regulations, &c., which affect it is not always the first to set a high value upon the canons of simplicity, clarity, and flexibility in ordering its own affairs.

The very title is a case in point. The word "rules" is usually too rigid for internal purposes and "standing orders" is much to be preferred.

The power that makes can unmake; the power that makes can also delegate power to vary. The characteristic of any code of standing orders is the power contained within them for suspension in certain circumstances. For example, the standing orders of a borough council provide that "any standing order may be suspended with the consent of a majority of the whole council or of three-fourths of the members present." This is a wholesome provision enabling the council still to be master in its own house, while having innumerable provisions for the proper conduct of its routine business. Indeed, it is the power of suspension that distinguishes internal standing orders from a number of external provisions. An administrative body can be much misled if it confuses the internal with the external. A well-known insurance committee at one time produced a code of standing orders into which it incorporated a number of provisions from Acts of Parliament. This tended to be misleading, because there was no power to suspend the Act of Parliament and to include the Act as a standing order might have implied that there was.

Recently a case which had been determined by the General Medical Council came before the courts in another form, and the General Medical Council have now decided "to suspend its standing orders" to enable a special application to be considered in the present month. The suspension of a standing order does not in the least imply the setting aside of the permanent provisions, but it illustrates the flexibility with which the code was originally designed.

Sometimes the object of a standing order is merely to give a general indication as to what is regarded as the normal practice. An interesting illustration of this arises in the recommendation of the Ministry of Health to local authorities to include in their standing orders the following provision: "If any question arises at a meeting of the council as to the appointment, promotion, dismissal, salary or condition of service or as to the conduct of any persons employed by the council, it shall be considered by the council in committee unless the council otherwise resolve." It is important to notice that a bare majority of the council (which might be down to its quorum) can set aside that provision at any time, and it might well be asked why the provision is included at all. The answer is, as suggested above, that it sets out a normal line of practice from which deviation will be made only if good cause is shown.

JUSTINIAN.

NEARLY 3000 male nurses will benefit by new scales of salaries recommended by the Rushcliffe Committee. Half the extra cost will be borne by the Exchequer. The nurses to benefit are those employed in hospitals and public-assistance institutions, and in sanatoria, tuberculosis hospitals or hospitals mainly concerned with the treatment of this disease, and tuberculosis wards. By the new scales superintendent nurses are placed on an annual salary basis. The old minimum weekly salary is increased by 14*s*. for all charge or head nurses in hospitals or public-assistance institutions, and by 9*s*. for staff nurses similarly employed. For nurses holding only the Tuberculosis Association's certificate there is a rise of 14*s*. weekly on the old minimum salary for head nurses, and 12*s*. for staff nurses.

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In England Now

A Running Commentary by Peripatetic Correspondents

OPENING my copy of THE LANCET in a lonely spot in Java, my eye lights occasionally on the results of a recent membership exam. Glancing through to catch a glimpse of some familiar name, I seldom fail to find someone I once knew. "Why, there's old Ivor, got his membership; he used to be a clerk when I was houseman to A. P.'s firm. However did he do it?" Then with a rush comes the thought, "was I a fool not to take that job in the E.M.S.? I might have had my fellowship now."

Most G.D.O.s in the R.A.M.C. are resigned to the fact that they have lost the war years as far as professional advancement goes. Those that seek to console us point to the enormous benefits derived from travelling, active service, discipline, and the all-round education which the Army provides. This may be, but it is the letters after our names that are going to count in the future; no medical service can be expected to recognise the degree of "EX-R.A.M.C." Furthermore, let us hope that in future appointments no preference will be shown to us over our better qualified colleagues. When eventually we do appear, with yellow skins and the classical headgear, treat us as chaps who have been away on a long holiday; no favouritism or sympathy please. We'll catch up.

Meanwhile, most of us here, accustomed to moving ourselves and our chattels to a place unknown at very short notice, cannot help but smile at the shaking of civilian heads over the proposal to direct doctors to certain areas where they are most needed. What bliss to be directed even in the direction of the U.K.!

* * *

When the new section of endocrinology of the Royal Society of Medicine met on May 22—alas, without Sir Walter Langdon-Brown, its president—the question in everybody's mind was: "Will this be a flourishing section?" Many people were against its formation from the beginning and, as the chairman remarked, detractors lost no time in dubbing it the "section of *West End*ocrinology." "Yes, but look at the United States," say the enthusiasts. "Why?" counter their opponents. Personally, though I should hate to see endocrinology "catching-on" over here as it has on the Continent and in the States, I think it does deserve a section of its own.

By its finger-in-every-pie nature endocrinology has to be a correlating, organising branch of medicine. Our knowledge of the endocrine glands has come from members of many branches, and the results of endocrinological research find application in anatomy, for example, as much as in biochemistry or clinical medicine. What then should be the criterion of an endocrinologist? He should ideally be a surgeon or physician with wide general clinical experience, of exceptional versatility, and with a particular interest in endocrine glands. He should have had experience in experimental physiology and biochemistry, in neurology, in biology and heredity, in history, and in psychology. To this should be added broad-mindedness, readiness to accept new ideas, ability to form an opinion of his own and to make clear definitions. He should have an aptitude for sound judgment and constructive criticism, not hampered by blinkers. He must never use his learning to cover his ignorance or his inability to arrive at a diagnosis. He should have the imperturbable conviction of a Murray or Banting, the careful fact-weighing logic of a Cushing, the undiminished enthusiasm of a Langdon-Brown, the collector's pride and knowledge of a Parkes Weber. In a word, the endocrinologist should be one of the scholars of the profession. I am afraid there won't be many of us.

* * *

The delicate paragraphs on the delights of lying in bed describe what is, despite any refinements in surroundings, mainly a thalamic business. The charms of the occupation depend not so much on the prints which adorn the bedchamber walls as on a comfortable mattress, a sufficiency of light warm clothing, and a suitable response on the part of she who has already prepared the breakfast. There is another form of recumbency of much greater importance since it favours the highest activities of the cortex—I refer of course to lying in a hot bath. In this instance the surroundings are of paramount importance, since sensory stimuli from the outside world must be eliminated to a point at which they cease to obtrude on the conscious mind. A gushing supply of boiling water is a prerequisite; without it nothing can be achieved, since a tepid bath annoys and a cold bath engenders a harmful superiority complex and stimulates mere physical activity. The bath must be taken at night, because the morning affords neither the time for contemplation nor the levels of blood-sugar and blood-pressure needed for rapid work at the cortical synapses. It is in securing a harmonious flow of visual stimuli that the most expensive difficulties lie, and I myself find that indirect lighting, pale green tiling of the walls, and fittings to match achieve the best effects, though the actual colour is of course a matter for personal judgment. The olfactory and auditory nerves are fortunately less difficile; judicious use of a favoured bath-salt will soothe the hippocampus, and no bathroom worthy of the name is noisy. It is perhaps significant that the skin and deeper proprioceptive fibres can scarcely be better served than by that beneficent principle of Archimedes which decrees that a body immersed in water will appear to lose weight. Finally, an ash-tray and matches must be conveniently to hand since nowhere is the flavour of tobacco so delicious as in the bath. The stage is now set for the distillation of peripatetic wisdom, the enunciation of fundamental laws of Nature, or the formulation of new methods for evading income-tax.

* * *

For years I have been going to write a detective story. For title I had chosen *The Agnostic Organist*. The body, that of a promising choir-boy, would be found during Septuagesima in an atmosphere of decaying hassocks and psalters in a dark space behind the organ of one of our more fashionable Kensington churches. Suspicion would fall in turn on the ancient verger, the new and Romish curate, and one of the male altos. But the Senior Church Warden would have no doubt from the start that a man like the organist, who insisted on playing Reger and Karg-Elert in place of the Barnby and Stainer of his predecessor, must be capable of any infamy and therefore ipso facto the culprit. That is as far as I had got in a number of years, but I feel it is due to my public to warn them that they will have to wait a little longer for this remarkable book.

Some days ago I embarked for England, home, and penury, and settled down to a few weeks' comfortable respite before house- and work-hunting engulfed me. But I began to itch. Now a little itch here and there is nothing among friends in the tropics, but this one not only affected the most inconvenient parts but worked itself up into veritable paroxysms every night in bed. "Much as these symptoms would suggest scabies in any of your other patients," I explained to the S.M.O., "you will realise, I am sure, that that cannot be so in my case." "Obviously, Sir, that could not possibly be the cause in your case," replied the S.M.O., a good type of officer, who knew instinctively that senior staff officers simply do not have scabies, "but I suggest that you try a routine treatment or two with benzyl benzoate, just in case there might be some minor parasitic background to your complaint." (He will go far, this chap.) I called attention to my tender seborrhœic skin and asked him if he belonged to a protection society, but he merely handed me a bottle of emulsion. So I retired to the bathroom with a bad grace, a presentiment of dermatitis medicamentosa, and a secret determination that no promotion should ever come the way of that S.M.O. Reader, strictly between ourselves, the relief after but a few minutes was truly and absolutely incredible. I can imagine no greater boon to poor itching humanity, and most strongly recommend you to try it yourself.

But I digress. *The Agnostic Organist* cannot appear for some time yet as I am now busily engaged on *The Scabetic Consultant*. Readers who wish to get the most from this work should prepare by familiarising themselves with Mellanby on the same subject.

* * *

"... No man in medicine is wise enough to comprehend what he daily beholds."—A. E. Bennett. *J. Amer. med. Ass.* April 27, 1946, p. 1207.

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Parliament

IN COMMITTEE

ON May 22 the committee resumed consideration of Mr. H. Strauss's amendment to clause 5 deleting authorisation for the limitation of specialists' fees for private patients. Lord WILLOUGHBY DE ERESBY contended that it was not the function of the Government to interfere in a private contract between a specialist and a private patient, especially for services performed in "out of work" hours. The argument that the specialist would be using a State operating-theatre, staff, and equipment was largely answered by the Minister's statement that he wished private patients to be treated in hospitals.

Mr. A. BEVAN said if he thought the effect of the clause would be to drive specialists away from the State hospitals into private nursing-homes he would accept the amendment. But the provision which he was suggesting already existed in many of our best hospitals, and indeed had been devised by specialists for their own protection. The operations were to be performed in State hospitals with State facilities, which it was hoped to provide at a reasonable cost. The more reasonable the fees for hospital services the more some specialists might think they could charge their patients for operations. The ceiling would obviously be fairly high, and so reasonably good salaries could be obtained. Sir HENRY MORRIS-JONES interrupted to point out that the Minister had referred to "salaries," and Mr. BEVAN agreed he should have said fees, but he added "members of the medical profession have a terminological sensitiveness which astonishes me." If a specialist, Mr. Bevan continued, knew that he could provide his patient with better facilities in a State hospital, and yet advised a nursing-home in order to obtain greater fees, the sooner that kind of specialist got out of the hospital the better for the service. A committee would be appointed to fix the range of fees, and Mr. Bevan promised he would obtain professional advice before fixing any maximum. The amendment was negatived.

SPECIALISTS OUTSIDE THE SERVICE

Colonel M. STODDART-SCOTT, M.D., moved an amendment providing that all specialists should be able to treat their patients in State hospitals, thus safeguarding the patient's right to the use of a hospital bed even when seeking the opinion of a specialist outside the service. Many pension cases with war or industrial injury would not be satisfied until they got an independent opinion. Sir HENRY MORRIS-JONES, M.R.C.S., also supported the amendment, speaking on behalf of older physicians of experience and judgment who might not wish to join the service for their remaining years of practice. Mr. H. LINSTEAD thought there was here a stronger case for independent specialists than for part-time specialists, between whose public and private patients complications might arise. Also, he suggested, the Minister was more likely to be successful in attracting specialists to the service if the hospitals were open to them and they got to know the scheme by working there. The patient was free to take one part of the service and reject another. He also had complete freedom of choice of doctor. But unless this amendment was conceded the patient was not free to go to a public hospital unless he gave up freedom of choice of doctor.

Mr. BEVAN felt he could hardly be expected to provide an inducement to doctors and specialists to remain outside the scheme. A specialist who was not attached to a hospital and did not avail himself of the clinical experience and knowledge accumulated there would not, he suggested, be the sort of man anyone would want to consult. He would be intellectually impoverished and his advice would be of little value. Mr. Bevan thought that any specialist worth his salt would want to be attached to a hospital as early as possible. Some doctors, he knew, had said that as a consequence of the comprehensiveness of the scheme every doctor would be a State doctor and there would be nobody to give an opinion other than an employee of the State. But doctors were not to be employees of the State. They would be under contract to the governing boards of the teaching hospitals and not under contract with the Ministry of Health. They were largely part-time people and it would be absurd to suggest that these highly qualified men, with great academic distinctions, with vigour of mind and of character, would not be able to give a second opinion hostile to the first opinion because the State might be involved.

Mr. J. S. C. REID asked if specialists would be allowed to keep a substantial part of their time, say half, for private practice. Mr. BEVAN agreed that the utmost flexibility would have to prevail in this field, but as long as a specialist was attached to the public service, in no matter how small a degree, he would be regarded as being in that service. There would be no question that a specialist must spend half his time in the hospitals and half elsewhere; it might be much smaller than that. The amendment was negatived by 28 votes to 14.

OWNERSHIP OF HOSPITALS

Mr. RICHARD LAW moved an amendment to secure that all interests in the premises and equipment of voluntary hospitals should be transferred not to the Minister but to the hospital management committees and boards of governors, for unless they had real authority he did not see how they could become living entities. Mr. BEVAN said that management committees might be changed. In time we might have a different administrative unit. It was simpler to vest all hospital property in the Minister and then discuss frankly how the Minister was to ensure that hospitals are properly decentralised in their administration. What would really conduce to the authority of the management committees were their administrative functions and the financial flexibility of the whole machine.

Mr. REID asked whether alteration to hospital buildings would be done by the regional boards through local architects, by the Ministry of Health, or by the Ministry of Works. Mr. BEVAN thought that the nation had at its disposal a wider variety of talent than a local management committee. He would be frightened to give a local committee complete authority to design a hospital. He confessed he hoped there would be some standardised buying. The amendment was negatived.

THE TEACHING HOSPITALS

Sir H. LUCAS-TOOTH then moved that the buildings and equipment of the teaching hospitals should be transferred not to the Minister but to the new bodies to be created for their administration. Difficulties might arise in the transfer, he felt, from their close connexion with the medical schools. Mr. BEVAN said that he had been careful to devise a scheme for the administration of teaching hospitals which would leave them with the utmost autonomy consistent with the general hospital service. The teaching hospitals were not only satisfied, but some were delighted because their financial position in the future would be infinitely better than in the past.

If the teaching hospitals were broadly in agreement with the present structure of the Bill Mr. LINSTEAD said he could not explain why he had received a letter from the Voluntary Teaching Hospitals Association, which included the graduate teaching hospitals of England and Wales, stating that it had been unanimously decided to put forward certain suggestions, including this amendment. Mr. BEVAN said that he was sorry that such a letter had been sent because he was under the impression that the scheme in the Bill was highly satisfactory to the teaching hospitals. The letter went beyond the necessities of the case, because the transfer of the hospitals to the Minister would not make St. Thomas's Hospital any less St. Thomas's, Bart's any less Bart's, or Guy's any less Guy's. Their identity and continuity of tradition would be unbroken. All the imponderables which were there would be untouched. In fact, they would be enlarged and placed on firmer foundations. Furthermore, the Government wanted to have power to create new teaching hospitals. He would be unhappy to hear that the scheme did not commend itself to the teaching hospitals as a whole, but it would not alter his view if every teaching hospital in London went on record against the scheme, because it would still go through. He would like some of the teaching hospitals to bear in mind—and it was not a threat—that if they insisted on certain modifications in their direction as being necessary to get their consent, some other modifications might be made which might be disagreeable to them in order to get greater enthusiasm for this scheme

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from other quarters. If the teaching hospitals thought there was something wrong in taking over the hospitals, he added, would they agree if the buildings were left with them to undertake the capital obligations and use their endowments for structural purposes? The amendment was negatived by 25 votes to 17.

SPECIAL HOSPITALS

Mr. LINSTEAD moved an amendment to exclude special hospitals from transfer. Instances of the sort of institution in question which were given included the Papworth village for tuberculous patients, homes for the dying, homes for incurables, St. Andrew's Hospital, Northampton, the Jewish Sanatorium at Woburn Sands, and the Roffey Park rehabilitation centre. Mr. BEVAN said it was not intended to take over institutions which were not specifically hospitals or ancillary to hospitals. It might be in the interests of the inmates and of those who were responsible for these institutions that they should be taken over. Quite often the new health service might destroy the basis of their revenue and the clause provided that an institution could claim to be brought in. In some parts of the country the chronic sick were treated very badly. Under the new scheme he hoped the chronic sick would everywhere get much more humane treatment. The amendment was withdrawn.

LIMITING DIVERSION

On May 23 the committee continued with the discussion of the transfer of hospitals under clause 6. Mr. REID moved an amendment providing that any hospital premises or equipment taken over should not be diverted from their original purpose or district, "unless the Minister shall be satisfied on the advice of the Regional Hospital Board and of the Central Council that there was no need for hospital accommodation to be provided for that purpose or within that district." The best way to discourage future gifts would be to disregard the wishes of former donors. Mr. KEY said that in the development of a full hospital system institutions might be given functions other than those in their trust deeds. The Minister wished to observe the wishes of the donors so far as practicable, but the general service rather than the limited purpose of any institution must be considered. Mr. LINSTEAD pointed out that there seemed to be nothing in the Bill to prevent the Minister selling property and applying the proceeds to objects analogous to those for which the buildings were originally used, but in a different part of the country. The amendment sought to tie the objects to the district for which they were intended. Mr. MESSER thought the amendment sprang from the individualistic attitude of the voluntary hospitals who had no experience of coördination. Dr. BARNETT STROSS pointed out that one of the principal changes to be brought about by the Bill would be that cases of specific disease, after being sorted out, would be treated at centres where the best possible treatment was available. To make this policy effective some small hospital units would have to be interfered with. This amendment would hinder the provision of a better service for people who were getting a poor one at present. The amendment was negatived by 29 votes to 11.

SUPERANNUATION RIGHTS

Mr. KEY moved an amendment excluding from the transfers of rights and liabilities of hospitals to the Minister liabilities relating to superannuation which would be considered under clauses 63 and 72. There was however an important exception. Where a voluntary hospital had a liability for someone who had actually retired that liability was transferred to the Minister by this amendment. Mr. REID raised the question of officers of some mental hospitals in Scotland who had no legal right to a pension but to whom it had been the custom to grant pensions at pleasure. Mr. KEY said that it was intended to give ex-gratia payments to them with the Treasury's permission.

THE IMMEDIATE FUTURE

Replying to questions arising out of clause 6, Mr. BEVAN said he appreciated that the voluntary hospitals must feel themselves face to face with unknown possibilities. But they need have no apprehension about their power to extend, because the limit on that was not the unpredictability of the situation but lack of labour and materials. Approval had been given for some emergency schemes, and if any hospital had any such project its application would be considered. As soon as the Bill was passed the regional boards would be established so that hospital plans might be made as soon as possible, and as these plans were being made hospitals would be informed what their position was to be, so they would not have to wait until 1948. The Bill gave the Minister power to bring parts of the scheme into operation at different appointed days, so that parts of the scheme would begin in the meantime.

Any scheme under which the State accepted responsibility for free hospital service would have the effect of undermining the incomes of the voluntary hospitals, but he thought he could rely on those who were responsible for the voluntary hospitals, who were keen on their job, to keep their institutions up to the highest pitch of efficiency. He also hoped that in this interregnum charitably disposed people would assist, and that weekly contributors would continue their contributions. He must, however, protect the revenue a little from what might arise. Voluntary hospitals might have to use their capital or incur overdrafts, but he would remind them that before hospital endowments were distributed overdrafts would have to be deducted from the assets. If the voluntary hospitals piled up overdrafts they would be eating into their own funds. As far as possible he would try to push the endowments down into the management committees where they would fertilise the whole service. The regional board was a bit of an obstruction but when looked at realistically it broke down into hospitals. The hospital management committee was a living unit.

It was impossible, Mr. Bevan declared, for him to state at the moment which hospitals would be taken over, and which hospitals would be left outside the service. If he did so, he would immediately be placing an inhibition on the plans of the regional boards. Furthermore, many of the special hospitals—using the word to cover sectarian hospitals and those giving special forms of recognised therapy and treatment—might want to come into the scheme because if they were left out they might be ruined. Obviously if they were brought into the scheme their special sectarian and individual character must be preserved, because for the people who believed in it that in itself would be part of the treatment, and there would be an obligation on the regional boards to see that the management committees were of a character which maintained the tradition of these institutions. He thought he could give that absolute guarantee, because otherwise it would be an emotional mutilation which nobody could possibly defend. Turning to hospitals in the possession of other Government departments, Mr. Bevan confessed that despite his somewhat reckless character he would not dare to say that he intended to lay hands on the Admiralty's hospitals or the hospitals of the Ministry of Pensions. Later, when the scheme was in full operation, it might be possible—he was making no definite promise and accepting no obligation—to see how the other departmental hospitals could be dovetailed into the general health service. If he tried at this moment to adjust those other hospitals to the scheme, he would be doing something which the scheme could not digest. He did not believe that there was a serious belief among ex-Service men that medical advice in a Ministry of Pensions hospital was prejudiced. Especially it was hoped to preserve the plastic surgery groups which had been established and done such magnificent work during the war.

HOSPITAL ENDOWMENTS

Mr. REID moved an amendment to allow the management committees to keep the funds vested in the hospitals in their group. Thus if a hospital incurred an overdraft it would not, as in the present scheme, be spread over the whole country but would impoverish its own district. If it was right for the teaching hospitals to retain their endowments, why should not the other hospitals? Again regional boards were allowed to receive gifts so that even if they started equal one region might soon be better off than another. He hoped the Minister would allow gifts to be made to a hospital committee direct. Mr. BEVAN suggested that the Opposition were forgetting that we were anxious to take the provision of hospital services away from the atmosphere of private

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charity. A hospital dependent upon voluntary contributions and charitable endowments was not necessarily more humane than a hospital financed by the State. Humanity was to be found in the character and conduct of the people in charge of the hospital and in their freedom from bureaucratic interference. The Chancellor of the Exchequer would have been entitled to take all these endowments and use them to finance the scheme—and if he had the donors should only have been grateful that their private charities were now being enlarged by the State. But the finances for general hospital purposes were to be found by the State and the endowments used as pocket-money for the provision of additional amenities. If, as the amendment proposed, endowments should go to the management committees the old relationship between donor and hospital would still be broken, for in rural areas the committee might spread over quite a distance. The endowments would be fairly allocated in accordance with the number of beds and the needs of the area. There would be no possibility of some committees having no money because they had no rich people in their area. Mr. Bevan refused to give an indication how the money might be used, for he was anxious for the boards to spend it independent of central direction.

Captain A. MARSDEN asked if the Minister was going to seize and disburse the King Edward's Hospital Fund, and Mr. BEVAN said no, but added he would be loth to believe that the fund would be distributed to hospitals for use over and above their other sources of income. There were many other purposes for which it could be used.

Colonel STODDART-SCOTT asked if endowments would be returned to hospitals which became teaching hospitals after the scheme began. Mr. BEVAN thought that problem could be left for the future, but admitted something would have to be done about it. All the teaching hospitals would receive far more money from the State than they could themselves find. But among the other hospitals while some had more money than they needed, others had no money at all. That was the reason for the different methods of dealing with the endowments of teaching and non-teaching hospitals. If more teaching hospitals were created we should have to provide for them.

When the committee reassembled on May 28, Mr. KEY advanced an amendment that the board of governors of a teaching hospital should hold endowments not only, as laid down in the Bill, for "the purposes of the teaching hospital generally," but for "such purposes relating to hospital services or to the functions of the board under this part of this Act with respect to research as the board think fit." The amendment was carried.

Sir HUGH LUCAS-TOOTH, moving that subsection (5) of the clause should be omitted, said that his aim was to obtain a general discussion of its terms. The allocation of capital and the expenditure of income from endowment funds was, he said, to be at the discretion of the Minister. There was nothing in the Bill to prevent the Minister from telling hospitals that income from endowments must be used for day-to-day expenditure. How did the Government propose to apportion the fund? There should be some consideration of local patriotism, which had prompted the donors. Were the donors' intentions to be considered in apportioning the funds? It was an act of meanness by the Government to propose settlement of hospitals' liabilities from the fund. Finally, why should the fund be kept under the control of the Minister?

Lord WILLOUGHBY DE ERESBY made a plea for the avoidance of centralised control of expenditure which, he thought, made for rigidity. He quoted experience in the Services where the lack of authority to make local purchases sometimes entailed payment by the staff for necessities. This could be avoided if management boards were entitled to handle the money.

Mr. KEY said that hospital management committees and regional boards would have considerable latitude. But, while proposals for the capital use of endowment funds would be initiated by the regional boards, approval should be left to the Minister. He pointed out that the regulation of their use did not lie wholly with the Minister. In the apportionment of funds, the specific conditions in each region must be considered, and control was to be in the hands of the Minister to ensure equal distribution. Maintenance would, he said, be met from the Exchequer.

Mr. LINSTEAD recalled that the Minister had said that social amenities would be covered by the endowment funds after debts had been paid and the money distributed. This arrangement was arbitrary. Treasury confiscation was being disguised under the title of a Hospital Endowments Fund. Soon it would be found that the fund was insufficient for needs, and Treasury grants would have to be made.

Mr. KEY, replying to a question by Colonel STODDART-SCOTT, said that endowment funds would be applied to the settlement of debts only of voluntary hospitals and not also of local-authority institutions. Before the report stage, steps would be taken to extend the power of holding endowments, now vested only in the regional boards to the hospital management committees. The retention of the subsection to the end of paragraph (b) was approved by 28 votes to 13.

On a motion by Mr. KEY, the subsection allowing for the application by the regional hospital board of income received from endowment funds to hospital services was extended to "the functions of the board under this part of this Act with respect to research."

ENFORCEMENT OF COVENANTS

Mr. KEY put an amendment to the subsection defining the term "endowment" in the clause to include "rights under any bill of exchange, promissory note or gratuitous covenant for the payment of money." This evoked considerable resentment from the Opposition. Mr. STRAUSS said that the covenant should not be enforced against those who had given to other people and for other purposes. Sir HAROLD WEBBE described the proposed procedure as plain seizure by the Government. The covenant was a contract. By the terms of the amendment, those who had engaged in a covenant would be paying twice for the service.

Mr. KEY did not give the assurance for which he had been asked—that the Government would allow, as did the voluntary hospitals, convenants to be broken without instituting legal proceedings. Endowment funds, he reiterated, were not for normal maintenance but for charitable uses by the regional boards and management committees. The amendment was approved by 27 votes to 14, and the clause was ordered to stand.

MEDICAL SCHOOLS

Mr. KEY moved an amendment to clause 8, which is concerned with the retention of property by medical and dental schools associated with hospitals, to allow that the property of the Welsh National School of Medicine should, on the appointed day, pass to the governing body of that school. This was approved, as was his amendment excepting the University of London and the University of Wales from transfer of schools' property "to the governing body of the university of which the school is a part." Mr. Key submitted an additional subsection allowing that postgraduate institutes of medicine or dentistry should retain their own property and liabilities in the same way as other medical or dental schools. He said that he had in mind particularly the Postgraduate Medical Federation. This also was approved. On the difficulty of defining which was hospital property and which was school property, where the two were together, Mr. Key said that divided ownership would be controlled by regulation. Clause 8, as amended, was ordered to stand part of the Bill, and the committee adjourned.

FROM THE PRESS GALLERY

A Little Less

In announcing in the House of Commons on May 25 the agreed reduction by 200,000 tons of bread grains in our import claims up to September Mr. H. MORRISON explained that our forward import programme included a certain amount of wheat and flour which was already owned by the Ministry of Food and was in transit here, a further quantity which was definitely earmarked for the United Kingdom but which was not yet physically in our possession, and a residue which was claimed for

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our programme, but which had neither been acquired nor earmarked by the Combined Food Board. It was from the last category that the cut had been made. We had not, in fact, given up a single ton which was either here or on the way here, or either owned by or allocated to the United Kingdom. What we had done was to reduce that part of our claims which was outstanding and not covered by supplies already acquired or earmarked. This was, nevertheless, a most hazardous step to take; but the whole world food situation was hazardous, and moreover, our own hazard as an importing country might well have been increased rather than diminished in the long run by assuming a rigidly negative attitude on this critical occasion.

QUESTION TIME

Prison Diet

Mr. W. H. AYLES asked the Home Secretary what was the daily caloric value of normal prison diet.—Mr. J. C. EDE replied: The average daily caloric value of the normal prison diet is approximately 3000.

Hypodermic Syringes

Mr. J. R. BATTLEY asked the President of the Board of Trade if he was aware of the scarcity of hypodermic syringes in London, and, as this was causing distress and danger to persons suffering from diabetes, would he immediately make a larger allocation.—Mr. JOHN WILMOT, Minister of Supply, replied: I have already arranged for increased supplies to be made available. Production has been stepped up and the position should improve rapidly.

Smallpox on Troopship

Mr. T. BRADDOCK asked the Secretary of State for War why the soldier who declined to be vaccinated on the troopship *Orion*, which arrived in the Mersey on April 7, was put ashore at Suez; and whether, in view of the fact that soldiers had a right to refuse vaccination and the additional fact that all the smallpox cases landed from troopships in this country had been vaccinated and revaccinated men, he would stop this treatment of men who exercised their rights in this matter.—Mr. J. J. LAWSON replied: Following the discovery of a case of smallpox on board the *Orion* all personnel were offered vaccination. One man refused. He was put on shore at Suez because it was considered that there would be a serious risk of his contracting smallpox himself and if this had happened it would also have increased the risk of infection for other men on board. I consider that the action taken was perfectly correct under the circumstances.

Future of E.M.S. Hospitals

Dr. S. SEGAL asked the Minister of Health whether he would give an assurance to existing E.M.S. hospitals that they would continue to be retained until such time as a coördinated hospital policy could be carried out.—Mr. BEVAN replied: As the commitments of the Emergency Hospital Scheme contract, the scheme itself must contract. But no emergency hospitals are given up without first considering the probable future needs of the hospitals services.

Doctors' Houses

Major GUY LLOYD asked the Minister whether, in the development of housing estates, provision was being made for houses large enough to be used as a doctor's house and surgery.—Mr. BEVAN replied: Local authorities are being advised in laying out their housing estates to leave space for houses of this kind which can be built a little later when materials and labour are more plentiful.

Gastro-enteritis in Leeds Schools

Mr. T. W. STAMFORD asked the Minister of Education whether the investigations of the schools medical section of her department into the outbreak of gastro-enteritis among children attending schools in West Leeds had been completed; and, if so, what they had revealed as to the cause of the outbreak.—Miss ELLEN WILKINSON replied: I have received an interim report from one of my medical officers which shows that the outbreak affected some 260 children from 14 schools in Leeds served by one central kitchen. The investigation, which is being conducted by the local authority, is not completed and the cause of the outbreak, which though widespread does not appear to have been serious, has not yet been determined.

Colonial Medical Service

Mr. A. D. DODDS-PARKER asked the Secretary of State for the Colonies to what extent there was a shortage of European medical officers for Government service in the colonies; what steps he was taking to rectify matters; and whether he was satisfied that the existing scale of salaries was sufficient to attract highly competent specialists on short-term appointments for work in these tropical areas.—Mr. GEORGE HALL replied: There are 128 vacancies in the Colonial Medical Service. The vacancies are being advertised, and appointments are overtaking retirements at the rate of about 15 a month. I am not satisfied that the conditions offered in a number of colonies are sufficient to attract highly competent specialists either for short or long terms. I have however recently made proposals to a number of colonial governments designed to remedy this defect. Some of these governments have agreed to the proposals; others still have them under consideration.

East African Medical Services

Mr. DODDS-PARKER asked the Minister the number of fully trained and qualified African or Arab doctors now practising in government or private service in Northern Rhodesia, Nyasaland, Tanganyika, Uganda, Zanzibar, and Kenya, respectively.—Mr. HALL replied: There are no Arabs or Africans with registrable medical qualifications in these territories, but 65 Arabs and Africans in the four East African territories hold the Makerere College medical diploma which these governments recognise as qualifying for a licence to practise. A further 66 students are in training at Makerere, which is the only institution for higher medical training in East Africa. In Northern Rhodesia and Nyasaland Africans are not at present undertaking higher medical training at Makerere or similar institutions, since the general standard of education is not yet sufficiently advanced in these territories. With the expansion, however, of the local lower-grade medical training facilities and of educational facilities generally which is contemplated under the development plans of these territories, it is hoped that within a measurable time men will be coming forward who are able to proceed to a higher medical course. In all six territories there are institutions for the training of junior medical staff such as hospital assistants, medical orderlies, nurses, &c.

On Active Service

MENTIONED IN DESPATCHES

R.A.M.C.

Brigadiers.—G. E. MacAlevey, D.S.O., M.C., A. N. T. Meneces, C.B.E.

Colonel J. R. Dawson.

Lieut.-Colonels.—R. H. Baird, P. W. Hannay, I. Harris, M. S. Holman, W. C. Mitchell, C. E. Moorhead, F. H. Morrell, W. O'Callaghan, R. A. Philp, W. Serle, C. S. Smalley, M.C., H. G. H. Waters, G. A. S. Akeroyd.

Majors.—J. S. Mackay, D. Billig, N. H. Bloom, R. T. Bowes, C. W. P. Bradfield, C. McL. Craig, W. R. McK. Couper, J. A. Farrell (killed in action), W. G. Ferguson, W. Fielding, T. Fitt, L. A. Ives, H. T. Laycock, T. R. Maurice, J. McIntosh, D. S. Milne, H. G. Page, W. W. Park, F. D. F. Steede, F. Stephenson, J. D. Younghusband, H. A. Daniels.

Captains.—W. K. N. Brown, R. N. Cates, W. H. Chase, D. H. Crook, R. S. Gibson, J. Griffith, A. A. Martin, G. S. Moore, J. J. Phillips, G. H. Pimblett, M. F. Ronayne, H. M. Smallwood, W. T. Stone, R. L. Witney, R. Groat.

Lieutenants.—R. D. Nicholson, N. Slater.

I.M.S.

Colonels.—W. A. Burki, C.B.E., A. H. Craig, V. E. M. Lee.

I.A.M.C.

Lieut.-Colonels.—A. S. Rao, D. R. Cattanach, D. K. L. Lindsay, R. D. Scriven, M.C., F. W. Snedden.

Majors.—S. N. Mukerji, T. J. Davies, G. K. Mitra, A. C. Greene, W. E. Owens, A. N. Subbaraman, S. F. Thomas, Abdul Hamid, S. H. Barker, C. K. Rao, M.C., I. S. Dalton, D. K. Mitra, Hussain Reza, J. F. Guerra, O. K. Keshavan, K. P. Bhavani, K. N. Sastri, M. C. Nath, Mohd Aslam, M. T. Aliappa, Mukand Singh, O. N. Tyagi, Ragunath Singh, A. A. Rawat, Santhana Sankaran, O. Sookias, T. N. Pisharoti, T. J. Gupta, V. C. Venkatachalam, T. S. Vishwanatham, A. M. Yusuf, G. M. Chakrabarti, I. P. Sen, K. N. Rao, S. J. Luxa, Vedprakash Batra, N. M. Maitra.

Lieutenants.—C. L. Nagrath, C. R. S. Iyengar, B. B. Gosh, V. A. Pepperel, Pritam Singh, P. K. Tamaskar, S. C. Sen.

Sir Arthur MacNalty's presidential address to the history of medicine section of the Royal Society of Medicine on the Influence of Medical Poets on English Poetry will be published in full in the June issue of the *Poetry Review*, the journal of the Poetry Society Incorporated.

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Letters to the Editor

SHORTAGE OF NURSES

SIR,—Professor McNee has touched on the difficulty of "bridging the gap" between school-leaving age and the age of entering hospital as a student nurse. His plan for nurse-training colleges for girls of school-leaving age would, I suggest, carry specialisation back too far. In such colleges the girls would presumably be working only with those who intended also to enter the nursing profession. Whether he refers to the secondary-school leaver of 16, or the younger primary-school leaver, the "gap" should be a time to widen out and learn to live in the world, rather than to join a community of prospective nurses.

The training course for the nursing profession is a resident one; it takes from three to four years, and in spite of increased off-duty time it is still sufficiently strenuous mentally and physically to limit the amount and range of outside interests which a girl can follow while she is training. If she has gone into hospital with a restricted outlook she may develop the "shop" mentality and conversational habit which our patients often deplore in their private nurses, and which have various ill effects in hospital life also.

Now that girls can begin the hospital course at 18 or even younger, it seems more important than ever that in the earlier impressionable years the future nurse should make contact with many different interests, learn to mix easily with many different types of her fellow-creatures, and widen her experience of human nature and of the world around her. Fortunately our present social habits make this easier for girls in their teens than it has ever been before.

I realise the practical importance of keeping up interest in nursing during this time. Surely the solution is to be found in the arrangement whereby girls can take a pre-nursing course in the sixth form of their secondary or public school, or a full-time or part-time course at a technical college. These pre-nursing courses, which are approved by the Ministry of Education, already contain all the elements of value in Professor McNee's plan. The curriculum provides for continued general education and gives also the special subjects for part I of the preliminary State examination for nurses—anatomy, physiology, and hygiene, together with some elementary chemistry and physics, invalid cookery, first-aid, and visits to hospitals.

It may well be that the pre-nursing course is capable of improvement in the light of experience, but even in its present form it is a useful preparation for hospital work. The girl who takes it is working with colleagues preparing for many other occupations and has teachers with a wider equipment than that of the average sister-tutor, excellent as she may be for the actual nursing work later. It lightens the work of the first year of training and it is already given in over 200 schools and colleges, the addresses of which can be had from the Nursing Recruitment Centre.

H. MORLEY FLETCHER,
Chairman, Nursing Recruitment Committee.
Nursing Recruitment Centre,
21, Cavendish Square, London, W.1.

THYROTOXICOSIS TREATED WITH THIOURACIL

SIR,—Dr. Wilson's interesting paper of May 4, comparing the actions of thiouracil and methyl thiouracil in thyrotoxicosis, prompts me to add some personal observations.

I can confirm that, on the whole, the lag period between the start of treatment and the relief of symptoms is shorter with methyl thiouracil than with thiouracil. I have used even smaller doses of the former than Dr. Wilson (0·4–0·6 g. per day) with good results. It seems to be important to make single doses as small as possible and to spread them evenly over the day (e.g., 8–11 single doses of 0·05 g.).

Although gross enlargement of the thyroid gland is unusual with this dosage of methyl thiouracil, some enlargement of the gland and a definite increase in firmness occurred in most patients. Larger doses produce thyroid hyperplasia, probably to the same extent as does thiouracil. A retrosternal goitre should be regarded as a contra-indication to both drugs, though small doses of methyl thiouracil may be tried. I have seen one patient with a retrosternal goitre who developed severe intrathoracic pressure symptoms (stridor, dyspnœa, cyanosis, &c.). Considerable improvement followed discontinuation of treatment and was kept up by a maintenance dose of 0·025 g. of methyl thiouracil.

Exophthalmos in fully developed cases does not seem to be affected, even when small doses of thyroid are added after all the other symptoms have abated. Lid-retraction responds well; this effect must not be mistaken for an improvement of the actual proptosis. Like Dr. Wilson, I have seen no successes in cases of anxiety neurosis.

A complication which, though apparently rare, necessitates discontinuation of treatment is drug fever. The rise in temperature may be high (102°–103° F). In one case treatment with 0·6 g. of methyl thiouracil per day was tolerated well until the 14th day when high temperature set in. The temperature fell to normal immediately after treatment was stopped but fever recurred after the third tablet was taken on resumption of treatment. Similar observations were made by R. H. Williams et al. (*J. clin. Endocrinol.* 1946, **6**, 23). It is interesting that in my case fever was accompanied by a rise in the number of white blood cells (from 5000 to 9000 per c.mm.) and that the differential white count showed an increase of polymorphs and a decrease of the initial lymphocytosis. I have not found other reports on the blood-count during febrile reactions due to thiouracil or methyl thiouracil, but this observation suggests a stimulation of granulopoiesis contrary to the suppression which these drugs usually produce.

London, W.1. H. H. UCKO.

ARTIFICIAL PNEUMOPERITONEUM

SIR,—Dr. Simmonds's excellent article (April 13, p. 530) prompts me to offer some observations on the conduct of therapeutic pneumoperitoneum.

Site of Air Injection.—It seems immaterial whether air is introduced on the right or the left side of the abdomen, since, once introduced intraperitoneally, it tends to collect more readily under the paralysed than the non-paralysed hemidiaphragm. This is a point of some importance since trauma of the liver is a possible, though very rare, cause of air-embolism, as it was in Dr. Simmonds's case 1.

Position of the Patient.—The fate of the air after injection can be considerably influenced by attention to this factor after induction and refills. My patients are always instructed to assume that position in bed which renders the paralysed hemidiaphragm as nearly as possible the highest part of the abdomen. This device, coupled with moderately vigorous massage of the abdomen, encourages the air to accumulate under the paralysed half of the diaphragm. This is particularly useful on first waking in the morning when much of the air may have become displaced owing to the various postures assumed during the previous night's sleep.

Manometric Pressure Observations.—Dr. Simmonds rightly points out that no negative pressure readings are obtained during induction or refills of pneumoperitoneum. I cannot persuade myself that any true readings are ever obtained during P.P. refills. A manometric "swing" is only observed when the air is actually being introduced. This swing is, however, in no sense a record of intraperitoneal pressure but is merely a reflexion of the varying resistance presented by the apparatus and the contents of the abdomen to the flow of air. Only occasionally is a swing observed which is synchronous with respiratory movements and which reflects alterations in the resistance to the inflow of air relative to those movements. The exact nature of this swing is determined by the respiratory movements of the unparalysed hemidiaphragm and the abdominal wall. If little movement of the abdominal wall takes place then the manometric pressure goes up during inspiration and down during expiration (the opposite of what is observed during A.P. refills), and vice versa if the respiratory movements of the abdominal wall are well marked. All these manometric readings are, however, not actual measurements of intraperitoneal pressure. It is, therefore, difficult to understand what Dr. Simmonds means when he refers to "pressure + 5 cm." in case 1, "pressure + 10 cm." in case 7, and a "final pressure of + 12 cm." in case 8, unless he is referring to a pressure recorded with the point of the needle free in the total collection of air and with no air flowing through the apparatus

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into the peritoneal cavity. But how does he know that the needle is so placed; and does he obtain a manometric swing at the time this observation is made?

Edwards and Logan (*Tubercle*, 1945, **26**, 11) state that refills of between 500 c.cm. and 1000 c.cm. should be given twice weekly and later once weekly and that this will usually produce "intra-abdominal pressures of + 6 to + 12 cm. of water on inspiration depending on the tone of the abdominal musculature." Bearing in mind the observations made above, I find such statements, from a physiological point of view, quite meaningless.

Effect on the Diaphragm.—Edwards and Logan (*Ibid*) record that the average additional rise of the diaphragm obtained in 9 patients as the result of pneumoperitoneum was 6·5 cm. and the average total rise was 8·5 cm. I have observed in at least three cases with definitely paralysed hemidiaphragms (confirmed by X-ray screening) very large subdiaphragmatic accumulations of air, the only effect of which has been to push the liver down in the abdomen without raising the paralysed diaphragm. In two of these, adhesions between the upper surface of the liver and the under surface of the diaphragm have been observed. There is evidence that pneumoperitoneum can delay by several months the recovery of movement in the paralysed half of the diaphragm resulting from phrenic crush operation.

In my opinion there is a definite field of usefulness for P.P. treatment coupled with phrenic nerve interruption. Dr. Simmonds has performed a valuable service in presenting his incidence of complications in such a large series of cases. I have now treated a much larger number of cases than that on which a report of two deaths was based (Aslett, E., Jarman, T. F. *Lancet*, 1945, i, 304). No further complications or deaths attributable to the treatment have occurred. I am at present treating as outpatients a fair number of cases from among those who are awaiting admission to hospital and find that phrenic crush and P.P. is a useful adjunct to bed rest under these circumstances. In two cases the results have been good enough to render their admission to hospital unnecessary. I hope to report on these cases later.

Tuberculosis Clinic, Neath. T. FRANCIS JARMAN.

SECULAR TREND IN THE STILLBIRTH-RATE

SIR,—Is not the answer to Ian Sutherland's interesting query in the tentative query he himself makes at the conclusion of the penultimate paragraph of his letter of May 18? The hard core of stillbirth mortality is prematurity, and it is stated with confidence by nutritionists that there is a relation between nutrition of the mother and prematurity. As to the national rise in nutritional levels, especially of milk and vegetables, during the war years, conclusive evidence is given by Magee in his Milroy lectures (abridged publication in *Brit. med. J.*, March 30, 1946, p. 475).

J. GREENWOOD WILSON.
Public Health Department, Cardiff.

THE BEDPAN

SIR,—The bedpan is undoubtedly a major horror of life in hospital. Æsthetically revolting and physiologically inadequate, it is a symbol of the humiliation that has to be endured by all those who are forced to submit themselves to the medical machine. Medical men who fall into the hands of their colleagues usually stage an early revolt against this unattractive article of hospital furniture, yet when they are in charge of hospital patients they and the nursing staff accept it as part of the routine of life for all those in bed. The use of a bedpan involves a series of considerable gymnastic feats which are much more exhausting than the effort involved in a journey to the lavatory, or, if necessary, the use of a commode. Moreover, the design of a bedpan is so unsatisfactory that the fæces cannot fall away from the patient as they would if the physiological squatting position could be adopted; nor is the receptacle deep enough to permit the use of sufficient water to cover the fæces and so mitigate the smell.

Surely it is only necessary to inflict this discipline on whose who are acutely ill or really bedridden? In these days of light metal alloys, tubular furniture, and plastic materials the makers of hospital equipment and the medical profession should be able to collaborate in the design of a light, highly mobile, and hygienic commode suitable for hospital use. This could be brought to the bedside as easily as the surgical dressing trolleys now in general use and should not involve any extra work for the nurses. The receptacle should be deep enough to allow for a covering of water or deodorant fluid, and it should have adequate flanges to allow for easy removal from the framework and for thorough cleansing of all the apparatus that has been in contact with the patient's body. It is important that the cost should be as low as possible since every general ward would require several of them. Cubicles and private wards should be supplied with such commodes as part of their furniture, so that only the receptacle need be removed. These fixtures could be quite unobtrusive and inoffensive, and, despite the genteel title, need bear no resemblance to the formidable Victorian constructions of tapestry and mahogany.

As a medical man who has recently been forced to enjoy what might be described as a "worm's eye" view of hospital life, I appeal to some of my colleagues to initiate this relatively simple reform. They would enjoy the blessings of countless invalids through the years and thus would earn a fair title to immortality.

DOUGLAS MCCLEAN.
Rabley Willow, nr. South Mimms, Herts.

EPIDIDYMO-ORCHITIS

SIR,—In your last issue Dr. Tunbridge and Dr. Gavey state that the finding of a slight polymorphonuclear leucocytosis in their cases of epididymo-orchitis is against causation by sandfly fever, because they doubt whether such a simple complication would materially alter the blood-picture.

Uncomplicated mumps is, like sandfly fever, a leucopenic disease, but most observers agree that orchitis produces a polymorphonuclear leucocytosis. If epididymo-orchitis is an accepted complication of sandfly fever it may well be that it does (as in mumps) cause a neutrophil increase.

Bristol. R. N. HERSON.

ACUTE BENIGN DRY PLEURISY

SIR,—After reading Dr. J. G. Scadding's paper of May 25, I thought it might be of interest to record a similar outbreak which I observed in the closed community of a frigate in the Indian Ocean in May-June, 1945. I described this in detail in my official journal, but have no written records of my own and am here speaking from memory.

The epidemic affected about 15 of a ship's company of 135. One only was an officer, and the remainder were not confined to any particular mess-decks. The outbreak followed epidemic form in its case-incidence, with a rise to a peak followed by a decline and a small recrudescence later. The whole outbreak was over in about three weeks. Pleural pain was the marked feature of about half the cases, but there were some minor febrile cases without pain, and these of course would not normally be seen in a hospital. There was one case of lobar pneumonia with normal response to sulphonamide therapy, and one case of bronchitis. A pleural rub was heard in about 5, and in 1 there was acute diaphragmatic pleurisy simulating an abdominal condition but with shoulder-tip pain. The remainder presented few signs or symptoms other than pleural pain with or without an audible rub, pyrexia, and headache.

In the blood-counts I was able to do, I particularly noticed leucopenia with a relative lymphocytosis. In one case there was an absolute monocytosis. I do not remember at what precise stage of the illness the counts were made. No sulphonamides had been given.

I was particularly impressed by the fact that about 4 patients showed the secondary rise of temperature mentioned by Dr. Scadding in his review of the literature; in fact, I was tempted to suggest that the condition was an atypical form of dengue, in which the affection of the synovial membranes of joints had been replaced by a similar affection of the pleura. However, the absence of other characteristic signs and the circumstances of the outbreak made this very improbable.

Radiography of 2 patients who had had a very loud pleural rub showed nothing abnormal when, after their recovery, it was possible to get them ashore for investigation.

Coulsdon. V. H. MARTINDALE.

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CORRECTION OF MEDICAL REGISTER

SIR,—I am desired by the Returning Officer to say that voting papers for the purpose of the forthcoming election of five members of the General Medical Council to represent the registered medical practitioners resident in England were issued on May 28 to all practitioners having registered addresses in England; and that the authorities of the council would be glad if any such practitioner who has not received a voting paper would communicate immediately with the office of the council, *whether or not he proposes to vote in the election*, in order to ascertain that his address is correctly entered in the Medical Register.

C. WESTON.

General Council of Medical Education and Registration of the United Kingdom, 44, Hallam Street, London, W.1.

*** The names of the candidates will be found on p. 825.—ED. L.

BRUCE WOODCOCK *v.* FREDDIE MILLS

SIR,—The problem raised by Dr. Cunningham Dax in his letter of May 25 is an interesting one. Doctors with a conscience, who try to help boxers to avoid permanent cerebral damage, will find they are up against formidable opposition. A personal encounter may illustrate the difficulties.

A famous middle-weight boxer was admitted to a Service hospital with a fissure fracture of the skull, over the left motor cortex: there was a gap of about a $^1/_4$ inch. This was the result of a motor-cycle accident a week before. He was suffering from some confusion and had frequent jacksonian fits. (A sinister suggestion that his "hysteria" should be treated by a brisk slap was luckily not followed!)

When he recovered I had several long talks with him, and later with his wife, about his future. They listened attentively and seemed convinced that a year's respite from serious boxing was imperative. He admitted that in previous fights he had often had particularly heavy punishment from repeated right hooks to the site of fracture.

As it turned out, he resumed boxing in a matter of weeks (in spite of being officially forbidden), was readmitted to hospital, again returned to the ring, and continued his career in spite of only second-rate form. He never again reached the top class.

It is not difficult to guess at the kind of vested interests (promoters, &c.) that urged this man to "be a sport" and disobey the urgent advice which at the time he had gratefully accepted.

Tunbridge Wells. C. R. MCLAUGHLIN.

REMUNERATION

SIR,—Your leading article of May 18 speaks of a possible addition of one-third to the remuneration recommended by the Spens Committee to get the post-war equivalents. If general practitioners want a square deal from the Government they should press this point before they enter into any agreement; otherwise they will never get satisfaction. The present war bonuses to members of the profession in full-time public-health service are an insult. The highest war bonus is £60 (and many authorities do not pay so much) which is 12% on £500, 8½% on £700, and still less on higher salaries. Incidentally this £500–£700 scale is too low, bearing in mind that the great majority of public-health officers had hospital experience and a D.P.H. before being appointed.

D.P.H.

*** The *Economist* of May 18 adds rather more than one-third when translating the Spens Committee's 1939 figures into their current equivalent. It says that: "a capitation fee of 15*s.* 6*d.* in 1939 would be roughly equal to 23*s.* 6*d.* at today's prices." It also remarks that this amount, multiplied by 45 million patients, "would give a total cost of about £52 millions for general practitioners' pay alone, whereas the estimate given in the Financial Memorandum to the Health Service Bill of the whole of the cost of the general medical services, including the general practitioner, pharmaceutical, dental and supplementary ophthalmic services, was only £45 millions."—ED. L.

DEATH AFTER SERUM

SIR,—It was both instructive and salutary to read Dr. Gardner's article of May 11 (p. 689) and your annotation in the same issue (p. 694). It was, however, with some surprise that I read that in the case Dr. Gardner records the antitetanic serum given at the hospital in the first place had been "injected into the pectoral muscle *just below the right clavicle*." The italics are mine.

My attention has again been drawn to this anatomical area as a site for injection by a case of a youth aged 18 years seen a week after reading Dr. Gardner's article. He had been given a similar injection of 3000 units of antitetanic serum in the left infraclavicular region. A week later the infraclavicular region was bulging, tense, and erythematous and delimited by a serpiginous weal.

Is there a school which teaches that this area is suitable for injecting sera and other drugs? The pectoral region, or more precisely the substance of the pectoralis major in its costosternal portion, is well suited as an injection site, but surely it is wise to avoid the clavicular head and especially that portion immediately inferior to the clavicle? Dr. Gardner observes, "it is probable that the point of the needle had entered a vein, into which the injection was made." In the region of the middle third of the clavicle, which forms the upper boundary of the superficial infraclavicular triangle, not only is the cephalic vein endangered but also the axillary vessels. If there is a school which urges the giving of injections in this site such advocacy is utterly to be condemned. To the list of rules cited in your annotation to prevent fatalities I would add a fifth—the avoidance of a site where a large vessel may be endangered. Happily in my case the vessels had escaped injury directly although thrombosis of the axillary vessels was a sequela which had to be considered.

Farnham, Surrey. W. RUTHERFORD BLACK.

Public Health

Those Disabled by Phthisis

IN finding employment for people with respiratory tuberculosis the Ministry of Labour has hitherto been able to help only those who have shown substantial recovery—those, in fact, who were considered fit for ordinary employment with or without vocational training. Under the Disabled Persons (Employment) Act, 1944, however, all who are disabled by respiratory tuberculosis are covered. Voluntary registration began last September, and arrangements have been made for them to take courses, when necessary, in industrial reablement and vocational training. Employers are required to accept a quota of these patients, as part of their quota of disabled people. Those who are not fit for employment under ordinary conditions will be helped to find work under special conditions. The special arrangements applying to the tuberculous disabled have been published in circular 52/46. The disablement rehabilitation officer (D.R.O.) will, at the request of the medical superintendent of a sanatorium or other tuberculosis institution, visit and give general talks to groups of patients on their opportunities under the Act, and will interview any patient who is anxious about his prospects. (The superintendent will not be required, in this connexion, to supply medical reports on cases.) On his return home, the patient will come under the care of the tuberculosis officer of his area, who will have had a report on his condition from the sanatorium, and who will work with the local officer (L.O.) of the Ministry to get the patient settled in work. The tuberculosis officer must notify the L.O. of every tuberculous person under his care who is fit for some measure of work, and who needs and wants help in finding it; and also of any patients who, though not fit for work, want to inquire about prospects. In addition, the tuberculosis officer must, on request, send a medical report to the D.R.O., made out on the special form provided; this gives in detail the necessary facts which determine the physical capacity and limitations of the patient, and whether he is fit for ordinary or only for sheltered employment. The D.R.O. must be allowed to interview patients at the dispensary, when the tuberculosis officer will be able to advise him on the nature and conditions of work suitable for particular cases.

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Interviews are to be arranged as far as possible to suit the convenience of the tuberculosis officer and the patient. The D.R.O. will be guided by the tuberculosis officer's opinion of the patient's capacity.

If a person who is tuberculous, or claims to be, goes to the L.O. of his own accord he will be referred to his own doctor, who will send him on to the tuberculosis officer if he thinks fit. This will avoid the unnecessary reference to the tuberculosis officer of non-tuberculous cases. The D.R.O. and the tuberculosis officer will also work together in following up patients who are placed in employment, and no patient will be transferred from "sheltered" to "open" employment by the Ministry until medical opinion has been sought. The Ministry asks that local authorities and the authorities of voluntary sanatoriums, in filling their own quotas of disabled persons under the Act, will consider engaging registered persons with tuberculous disability for types of work suited to them.

Infectious Disease in England and Wales

WEEK ENDED MAY 18

Notifications.—Infectious disease: smallpox, 5 (all at Birkenhead); scarlet fever, 1112; whooping-cough, 2306; diphtheria, 369; paratyphoid, 2; typhoid, 5; measles (excluding rubella), 2658; pneumonia (primary or influenzal), 461; cerebrospinal fever, 49; poliomyelitis, 8; polio-encephalitis, 0; encephalitis lethargica, 1; dysentery, 120; puerperal pyrexia, 124; ophthalmia neonatorum, 68. No case of cholera or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on May 15 was 1035. During the previous week the following cases were admitted: scarlet fever, 40; diphtheria, 32; measles, 105; whooping-cough, 30.

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (0) from measles, 1 (1) from scarlet fever, 10 (1) from whooping-cough, 5 (2) from diphtheria, 52 (5) from diarrhœa and enteritis under two years, and 6 (1) from influenza.

Birmingham reported 4 deaths from whooping-cough.

The number of stillbirths notified during the week was 263 (corresponding to a rate of 30 per thousand total births), including 28 in London.

FOOD LEADERS

THE war has taught the housewife how to use a very limited range of foods to the best advantage; and in this tiresome task her native wit has been supplemented by encouragement and advice from the Ministry of Food. Mr. F. Le Gros Clark [1] is anxious that her better understanding of food values should be made the basis of further education in nutrition. He reminds us that much nutritional teaching during the war was done by food leaders—voluntary workers who kept in touch with the food advice centres, received leaflets from them for distribution, and often passed on cooking and nutrition hints by demonstration in their own kitchens to small groups of housewives. Courses of lectures and demonstrations have been arranged for these food leaders, but not all of them have attended. They are mostly housewives themselves, recruited from the women's organisations, but a fair number are men. Mr. Le Gros Clark is anxious that the services of these useful people should be retained in the future, and recalls the various means by which their enthusiasm can be preserved—by monthly rallies, newsletters, and conversations and correspondence with the food-advice organiser for the region. He emphasises the value of leaflets and duplicated information; besides keeping the food leader up to date on nutritional topics, they give her status among housewives. A small amount of public money would maintain the activities of twenty or thirty thousand volunteers, with a permanent framework of a few salaried officials and a steady service of new leaflets, bulletins, posters, and display material. Though it would be hard to prove that this outlay would be balanced in other directions—say by a saving on ill-health and absenteeism—it could hardly fail, in the course of years, to improve the nutrition of the nation.

1. Memorandum on the "Food Advice" work of the Ministry of Food.

CORRIGENDUM.—In the paper by Perrault and Bovet (May 18) the content of cachets or tablets of aminothiazole given on p. 732 (second column, 8 lines from foot) should be 0·1 g.

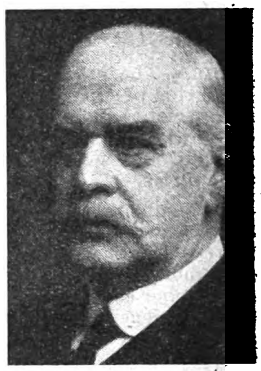
Obituary

THOMAS HASTIE BRYCE

M.A., M.D. EDIN., LL.D. GLASG., F.R.F.P.S., F.R.S.

T. H. Bryce, emeritus professor of anatomy at Glasgow, died at Oxford on May 16. Born in 1862, he was the son of Dr. Wm. Bryce, of Edinburgh, and a cousin of Viscount Bryce, sometime ambassador at Washington. He was educated at Edinburgh Collegiate School and at Edinburgh University where he graduated in 1886 and was later awarded a gold medal for his M.D. thesis.

His first anatomical post was as demonstrator to Sir William Turner at Edinburgh. In 1890, when appointed lecturer on anatomy at Queen Margaret College, he began his 45 years' association with Glasgow University. He became regius professor of anatomy in 1909 on the resignation of Prof. John Cleland, and on retirement from this post in 1935 he was given the honorary degree of LL.D.



Bryce was an international figure in the anatomical world. Perhaps his best-known work is his description, with the late Prof. J. N. Teacher, of the Teacher-Bryce ovum, the earliest then known, published in 1908 in their monograph entitled The Early Development and Embedding of the Human Ovum. This established him as a pioneer in early embryology and stimulated the search for earlier and yet earlier stages of human development. The initial phases of mammalian reproduction remained a paramount interest with him throughout an active career, and his many other contributions to this subject showed him as the foremost British human embryologist of his time; but his anatomical researches covered a wide range, and he wrote for example on topics so diverse as the histology of the blood of lepidosiren, the development of the thymus gland, and the structure of a West Scottish skull. As joint editor of the 11th edition of Quain's *Anatomy*, he wrote the sections on embryology, myology, and osteology and arthrology.

To the student, Professor Bryce was one of the dominant personalities in a medical school which at that time included such men as Sir William Macewen and Sir Robert Muir. His lectures were the result of much painstaking preparation, and it was impossible not to be infected with the ebullient enthusiasm with which he embedded and developed the ovum, unravelled the ramifications of the rhinencephalon, or unfolded the emergence of *Homo sapiens* from pithecanthropus and Neanderthal man. His interests and activities, however, ranged far beyond the confines of his department. He was elected a fellow of the Society of Antiquaries of Scotland in 1902, serving as vice-president for various terms, and was president of the Glasgow Archæological Society. His archæological papers included an account of excavations on the cairns of Bute, a report on a Viking balance of Gigha, and contributions to *Skara Brae, a Pictish Village in Orkney* by V. Gordon Childe and *The Book of Arran*. He was a member of the Royal Commission on the Ancient and Historical Monuments and Constructions of Scotland, and as curator of the Hunterian Museum at Glasgow he made many contributions to the archæological section, including skulls from Bronze Age graves in Arran. He likewise had a remarkable knowledge of painting, and was for a period a member of the governing board of the Glasgow School of Art and honorary curator of the Fine Art Collections of Glasgow University. In this latter office he was responsible for the proper housing of the Birnie-Philip collection. He himself was a considerable draughtsman, and many of his publications are adorned with his own illustrations.

In the midst of his many occupations Bryce always gave priority to the affairs of Glasgow University.

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He served on its court from 1919 to 1927 and did much to foster friendship and social intercourse among the members of the university staff. It was largely due to his persistent efforts that these enjoy the benefits of a college club, the envy of other universities. Until he retired he and two or three colleagues forgathered and did battle each Saturday on the golf-links at Prestwick. A man of powerful physique, who played with the same concentrated determination as he bestowed upon his work, he was in his heyday of the "par" class, and even in later years was a formidable opponent.

Professor Bryce became a fellow of the Royal Society of Edinburgh in 1898, served on the council, and held office as vice-president. In 1922 he was elected a fellow of the Royal Society of London. He married, in 1889, the daughter of George Wilson, of Dalmarnock, herself an accomplished artist. She died in 1934, and they leave a son.

JOHN WILLIAM WATSON STEPHENS

M.D. CAMB., F.R.S.

Dr. J. W. W. Stephens died on May 17 at his home at Ferryside, Carmarthenshire, where he was born in 1865, and where he had lived since he retired from the chair of tropical medicine at Liverpool in 1928. The son of John Stephens, barrister-at-law, he was educated at Dulwich College, and Gonville and Caius College, Cambridge, and studied medicine at St. Bartholomew's Hospital, graduating M.B. in 1893, and taking his M.D. in 1898. After qualifying Stephens devoted himself to research work chiefly in bacteriology while holding the Sir Trevor Lawrence and John Lucas Walker studentships.

After a short visit to India in 1897 as assistant bacteriologist to the government of India at Muktesar he was the following year appointed a member of the Malaria Commission of the Royal Society and Colonial Office, which during the next four years visited various parts of Central and West Africa and India. At this time practically nothing was known of endemic malaria and the foundations of our present knowledge rest largely on the pioneer work of the commission. One of the important objects of the commission was the investigation of blackwater fever, and the problem of its nature was an abiding preoccupation in Stephens's researches. It is to him more than to any other investigator that we owe the general recognition that it is not a disease sui generis, as at one time held, but a consequence of repeated malarial infection.

By the time the commission's work was ended the Liverpool School of Tropical Medicine had already come into being and Stephens was appointed Walker Myers lecturer there, and in 1913 he succeeded Sir Ronald Ross as Alfred Jones professor of tropical medicine. During the 1914–18 war, with the rank of lieut.-colonel R.A.M.C., he served as consultant in malaria to the Scottish, Northern, and Western Command, and at the head of a team of workers at the Liverpool school he undertook valuable researches into the treatment of malaria by quinine which largely modified prevailing ideas on methods of using this drug.

In 1910 Stephens with Fantham had made the unexpected announcement that there was not only one human trypanosome but, besides *T. gambiense* the usual form giving rise to sleeping sickness, another more severe type, *T. rhodesiense*, especially prevalent in south-east tropical Africa, a discovery now completely accepted. In 1922 Stephens also recorded a hitherto unrecognised new malaria parasite of man, *Plasmodium ovale*, the only species other than the three classical forms which has up to date been established. Stephens was awarded the Charles Kingsley medal in 1918, the Mary Kingsley medal in 1929, and the Manson medal in 1935. He was an honorary member of the Société Belge de Médecine Tropicale and of the Société de Pathologie Exotique. In 1920 he was elected F.R.S., and he was president of the Royal Society of Tropical Medicine and Hygiene in 1927–29. On his retirement from his chair at Liverpool he was made emeritus professor.

Stephens was one of the most acute and critical observers tropical medicine has known. His discovery of two major agents of human disease was no easy accident but the result of tireless and persistent investigation and critical scientific acumen. Apart from his work his interests were wide. Observing the habits of birds at home and in the jungle gave him pleasure. Later he became absorbed in local archæology, and he had a catholic knowledge of many other unexpected subjects, such as sun-dials and the principles on which they worked. Though somewhat reserved by nature, his deep integrity and his critical but appreciative mind made him a great friend, and where his feelings were engaged he was never sparing in his personal contribution.

In 1901 Stephens married Mary Sophie, daughter of Lieut.-Colonel E. C. C. Sandys, Indian Army, who survives him with two sons, one of whom is Dr. J. E. Stephens, of Welwyn. S. R. C.

Appointments

BOGGON, R. H., M.S. Lond., F.R.C.S.: consulting surgeon, Kingston County Hospital.
CLIVE, F. TEMPLE, M.B. Lond., F.R.C.S.: medical superintendent, British Legion Village, Preston Hall, Kent.
DEVILLE, P. M., M.R.C.P.: physician in charge of skin dept., Royal Waterloo Hospital for Children and Women, London.
FRESHWATER, Lieut.-Colonel D. G., M.B. Camb., M.R.C.P.: venereologist, Nigeria (Colonial Service).
HILLIARD, L. T., M.B. Camb., D.P.M.: temp. medical superintendent, Fountain Hospital, Tooting.
JARRETT, EDWARD, M.B. Camb., M.R.C.P.: medical first asst., St. George's Hospital, London.
MACKENNA, R. M. B., M.D. Camb., F.R.C.P.: asst. physician, skin dept., St. Bartholomew's Hospital, London.
OLDFIELD, M. C., M.B.E., D.M., M.CH. Oxfd, F.R.C.S.: surgeon, Leeds Public Dispensary and Hospital.
SHARP, H. S., M.B. Camb., F.R.C.S.: asst. surgeon, ear, nose, and throat dept., Charing Cross Hospital, London.
SHELDON, J. H., M.D. Lond., M.B. Manc., F.R.C.P.: director of medicine, Royal Hospital, Wolverhampton.
SHUCKSMITH, H. S., M.B. Leeds, F.R.C.S.: surgeon, Leeds Public Dispensary and Hospital.
STRATTON, FRED, M.D. Manc.: director, Ministry of Health Regional Transfusion Centre, Manchester.
TAYLOR, A. W., M.B. Leeds, M.R.C.P.: clinical pathologist, Kent and Sussex Hospital, Tunbridge Wells.
UNGLEY, H. G., M.D. Durh., F.R.C.S.: asst. surgeon, Royal Waterloo Hospital, London.
UPTON, B. H. B., M.B. Birm.: M.O., Fiji (Colonial Service).

Births, Marriages, and Deaths

BIRTHS

BARTHOLOMEW.—On May 23, at West Kirby, the wife of Surgeon Lieutenant Ian Bartholomew, R.N.V.R.—a daughter.
BLENNERHASSETT.—On May 19, at Stanmore, Middlesex, the wife of Captain T. H. Blennerhassett, R.A.M.C.—a daughter.
BRIGDEN.—On May 12, in London, the wife of Major W. W. Brigden, R.A.M.C.—a daughter.
MARKILLIE.—On May 19, at Wimbledon, the wife of Major R. E. D. Markillie, R.A.M.C.—a daughter.
MOIR.—On May 20, at Woking, the wife of Dr. J. H. Moir—a son.
NELIGAN.—On May 17, at Oxford, the wife of Captain G. A. Neligan, R.A.M.C.—a daughter.
PRYTHERCH.—On May 25, the wife of Dr. R. R. Prytherch, Criccieth—a daughter.
THOMPSON.—On May 23, the wife of Dr. John Thompson, of Edenfield, nr. Manchester—a son.
WOOLLEY.—On May 21, the wife of Dr. A. W. Woolley, M.B.E., of Wells, Somerset—a daughter.

MARRIAGES

BEATTIE—MATTHEWS.—On May 18, at Poole, Donald Elliot Hamilton Beattie, M.B.E., M.B., to Sheila Irene Matthews, 2nd officer W.R.N.S.
LOW—DAVISON.—On May 18, at Sandhurst, Berks, Maurice Gerald Low, M.B., to Stella Stewart Davison, 2nd officer W.R.N.S.
RUBEN—MACKOVER.—On May 19, Cecil Montague Ruben, M.R.C.S., to Joan Natalie Mackover.
WALLACE SIMPSON—MOLLETT.—At Colombo, Ceylon, Robert Wallace Simpson, surgeon lieutenant, R.N., to Betty Noreen Mollett, R.N.V.A.D.

DEATHS

ARMIT.—On May 22, at Worthing, Cecil Brodie Armit, M.B. St. And.
KIRTON.—On May 25, at Somersham, Hunts, Charles Imray Kirton, M.B. Lond., aged 83.
MACLEAN.—On May 25, at Bearsden, Peter Donald Maclean, M.A., M.B. Glasg.
MATTHEWS.—On May 25, in London, John Matthews, M.B. Camb., aged 73.

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Notes and News

NUTRITION IN AUSTRIA

AT a press conference in London on May 27, Colonel J. D. Cottrell, chief medical officer of the UNRRA mission to Austria, said that at the present moment the health of the Austrian people was fairly good, all things considered. The infectious-disease figures for all zones show a downward trend. Typhus has been limited to a few cases among refugees who have crossed the border. The incidence of typhoid fever has been steadily falling for the past six months; but news has just been received of an outbreak, apparently of some magnitude, in the Russian zone. Diphtheria, which has caused concern elsewhere in Europe, has not been troublesome in Austria; in the week ending May 4 only 240 cases were reported. But the incidence of pulmonary tuberculosis is high; the mortality per 10,000 population from this cause is 2·32. There was a heavy outbreak of bacillary dysentery in Vienna last summer, with a case-mortality of 20%; during the first twelve weeks of 1946, 568 cases with 142 deaths were reported. If a flare-up occurs this summer, and coincides with great reductions in the ration, the mortality may again be high.

Dr. Harvey S. Collins, medical consultant in nutrition to UNRRA, gave an account of the distribution of food in the country during the past year. For two months after Vienna fell in April, 1945, there was generalised looting and no organised distribution of food. For the three months from about June 18 to Sept. 25, the daily consumer-ration was 800 calories. Last September, 1550 calories was laid down as the normal ration, but this was met for only two months. The normal ration in December was 1460 calories a day, in January 1360, in February 1320, in March 1200, and in April about 1100. Until February it was possible to obtain about 250–300 calories beyond the ration; since then it has become increasingly difficult to obtain any extra food, and now even the farmers are feeling the pinch. Indigenous production will supply not more than 230 calories a day until the harvest. For June only 700 calories a day is assured. For July 900 calories is scheduled; and for September–December distribution on a 900-calorie basis is planned. The position is that, though there is as yet no large incidence of true nutritional disease, this will develop with the famine that is inevitable unless the present programme is improved.

SOCIAL SERVICES

CITIZENS' advice bureaux have done welcome service in the war years, and at a national conference of representatives of the bureaux in May, 1945, it was agreed that they would be increasingly needed in peace-time, as part of an independent and voluntary movement in full coöperation with statutory authorities and in particular with the resettlement advice service. The bureaux were an outstanding achievement of the National Council for Social Service, and have been financed partly by voluntary gifts and partly (about 50%) by grants from public sources.[1] In the annual report of the council[2] their future is discussed, if not exactly with misgiving, at least with some anxiety. In November of last year a Ministry of Health circular called the attention of local authorities to the value to the public of well-organised information services, and after mentioning the work of the C.A.B.S stated that grants would be forthcoming where local authorities decided to use such bureaux. The council hopes that as a result of this circular local authorities will continue and extend their assistance. It was announced during the year that the grant from the Ministry which the council has administered for the work of local bureaux would cease in April, 1946. Discussions were still going on about this when the report went to press, but the council note that unless local authorities are willing to increase their grants to replace this loss, the work of many bureaux will suffer and some will have to stop work. Nearly all the workers at C.A.B.S give their services free, but the work cannot be done without accommodation and a little equipment.

The bureaux are only one item in the wide range of activities covered by the council. The report tells of much work in the countryside: through its rural community councils the council administers loans and grants for the provision of village halls, encourages the status of parish councils, promotes the development of music and drama in the country, and supports and equips rural industries. Through its councils of social service it provides local centres in which voluntary effort in a neighbourhood can be knit together with the statutory bodies. It is promoting the foundation of community centres, and during the year has helped to establish a national federation of community associations. The report notes the revival of activity in men's community service clubs; the women's clubs have continued to develop during the war. The part the clubs might play in providing for needs of returning Service men and transferred war workers was discussed at a conference held last June.

The overseas and international work of the council has grown rapidly since the war ended. Thanks to help from the Nuffield Foundation the committee for the interchange of social workers and administrators hope shortly to send several experienced social workers on a visit to America. The council runs a social service library, and publishes leaflets and pamphlets giving useful practical advice on such things as evening refreshment centres, village halls, C.A.B.S, homeless children, and holidays. It also conducts social surveys and acts as a consultant for those interested in youth organisations, old people's welfare, adoption of children, playing-fields, and other social developments.

1. See *Lancet*, March 2, p. 311.
2. Annual Report 1944–45, National Council for Social Service, 26, Bedford Square, London, W.C.1.

PRE-NURSING COURSES

THE Minister of Education is urging local education authorities, and governing bodies of secondary grammar schools and establishments for further education, to set up the largest possible number of pre-nursing courses. He emphasises the value of part-time courses, of which only a few have so far been arranged. The Ministry of Health has already advised hospital authorities to approach local education authorities in areas where there are no pre-nursing courses with a view to getting them established, and the Minister of Education asks local authorities to try to meet these requests from hospitals.

In future the examinations for part I of the preliminary nursing examination are to be held in February, June, and October. Candidates attending pre-nursing courses due to end in the summer term, and who have reached the age of 17½ by the last day of June, will be allowed to sit for the June examination provided the school authorities undertake that the candidate will finish her course of training.

MEDICAL RESEARCH COUNCIL OF IRELAND

THE council's annual report for 1945 indicates the wide range of research which it sponsors. One of the most important investigations is that into dietary standards, which is being undertaken for the Eire government: height, weight, and hæmoglobin and other blood examinations have been recorded on persons passing through the health embarkation centres en route to Great Britain, and hæmoglobin estimations on women attending the antenatal clinic at the Rotunda Hospital have also been undertaken; the results are being examined. In the chemotherapy of tuberculosis, the mono-ethyl ester of methyl dodecyl succinic acid has given encouraging results in animal experiments; other promising compounds have been synthesised and are being evaluated in in-vitro tests. Further experience in the treatment of severe *Bact. typhosum* infections with combined penicillin and sulphathiazole has tended to confirm Prof. J. W. Bigger's laboratory finding that these exercise a synergic action. An investigation of calcium clearance rates has revealed that patients with normal serum calcium and with clinical evidence of calcium deficiency have a significantly more rapid clearance than normal adult controls; the test appears to serve as a method for differentiating between true hypoparathyroidism and pseudo-hypoparathyroidism. In the field of ophthalmology, it has been established that a type of mild follicular conjunctivitis, hitherto known as trachoma dubium, is trachoma; and this is thought to account for the spread of the condition in Ireland. Under the council's goitre prophylactic scheme, gr. $^1/_{10}$ potassium iodide daily is being given to school-children in the areas of co. Tipperary where goitre is endemic.

LIFE WITH BABY

IN the new *March of Time* film (11th year, no. 6) Dr. Arnold Gesell introduces a survey of some of the last 35 years' work at the Yale University Clinic of Child Development in evolving standard behaviour patterns for different ages and stages of mental growth. Children are observed through a one-way screen which prevents the child from knowing that he is being watched. Some of the stages of early development are shown, with the child following an object first with the eyes and later with the head as well, grasping it, then managing two objects simultaneously. An interfering grandmother who makes odious comparisons is told that each child has

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its own pace of development (which should reassure parents who find their child behind schedule on some detail). We sit with clinic doctors and parents watching older children at play together, while the doctor explains that behaviour that has distressed the parents may be quite normal for the age, and should not be punished.

This film is well worth seeing; it may stimulate doctors to re-read Dr. Gesell's *Infancy and Human Growth* and other works in readiness to answer the questions that they are likely to receive. The film was presented at the Empire, Leicester Square, on May 10.

A NEW HEALTH JOURNAL

A FAMOUS headmaster used to say that if a boy knew he had either a soul or a body there was something wrong with him. Like other epigrams this has its grain of truth: certainly it is a sign of disorder to think too much about health. This might be an argument against multiplying health journals; but much depends on the journal. In *Health Horizon*, the National Association for the Prevention of Tuberculosis have produced an outstanding quarterly which they can justly describe as "a magazine for everyone." The first number contains articles by Sir Harold Scott, V. B. Wigglesworth, L. D. Galloway, Jane B. Drew, Douglas Guthrie, and Negley Farson. The topics covered include mass radiography, risks to health caused by animals, the uses of D.D.T. in the tropics, the food value of yeast, village planning in West Africa, and Arabian medicine. The articles are informative and well written, and the reader, whether doctor or layman, will learn from them. This first issue has a bias in favour of tropical medicine which may reflect the intention of the editor to interest Dominion readers as well as those at home. The journal is not concerned with fussy rules for keeping fit, or advice on daily dozens: it is a serious essay in health education—an attempt to explain clearly to as wide a public as possible some of the facts about health and the prevention of illness. Its attractive cover, good print, and direct style should bring the success it deserves.

PENICILLIN IN THE B.P.

BY an amendment to the *British Pharmacopœia, 1932*, just issued, penicillinum (abbreviation penicil.) becomes an official medicament. When pure the sodium salt of penicillin is a white powder, in the form of granules or scales, and contains 1666 units per mg. Sodium or calcium penicillin which is not completely pure is a pale yellow to light brown amorphous powder, containing at least 300 units per mg.; it is hygroscopic, and must therefore be protected from the action of moist air. The salts are very soluble in water, but insoluble in fixed oils and liquid paraffin. The monograph lays down a standard mouse-test for toxicity and a rabbit-test for pyrogens. The salts of penicillin are dispensed in sealed containers and must be stored at a temperature not exceeding 10° C. The label must state which salt is present, the total number of units in the container, and the minimum strength in units per mg.

In appendix xv of the *B.P.*, which deals with biological assay, a new section, lettered X, gives details of the standard preparation of penicillin (a quantity of the dried sodium salt kept at the National Institute for Medical Research), the unit, and the cylinder-plate and broth-dilution methods of estimating potency. There are to be seven official preparations: (1) cream, made with 'Lanette wax SX' or its equivalent and a mixture of paraffins, containing 500 units per ml.; (2) sterilised cream; (3) injection, a sterile solution of the sodium or calcium salt in physiological saline, usual strength 20,000 units per ml.; (4) oily injection, a sterile solution of the calcium salt in white beeswax and arachis oil, dose min. 15–60, which contains 125,000–500,000 units; (5) ointment for the eye, containing 1000 units per gramme of a mixture of soft paraffin and wool fat; (6) lozenge, weighing 1 g. and containing 500 units; and (7) ointment, containing 500 units per gramme of ointment of wood alcohols.

Royal College of Surgeons of England

The college's programme for this month includes two Hunterian lectures: on June 6 Mr. D. S. Poole Wilson will speak on Missile Injuries of the Urethra, and on the 13th Mr. J. D. Fergusson will describe original observations on Carcinoma of the Prostate treated with Œstrogens. Prof. Arnold Sorsby will speak on Pure Penicillin in Ophthalmology (June 20) and on Genetic Aspects of Ophthalmology (June 27). The lectures will be given at 5 P.M.

University of London

Dr. J. N. Davidson has been appointed to the chair of biochemistry tenable at St. Thomas's Hospital Medical School as from April 1, 1946.

Prof. A. J. E. Cave has been appointed to the university chair of anatomy tenable at St. Bartholomew's Hospital Medical College as from May 1, 1946.

The title of professor of medical protozoology in the University of London has been conferred on Dr. H. E. Shortt, in respect of the post now held by him at the London School of Hygiene and Tropical Medicine.

Personnel of the Senate.—Owing to the resignation of Lord Moran as dean at St. Mary's Hospital Medical School, Prof. B. A. McSwiney, F.R.S., has been appointed one of the representatives of the general medical schools on the senate for the remainder of the period 1944–48. Among the appointments to the senate for the period 1946–50 are the following: from convocation, Sir Ernest Graham-Little, M.P.; from the faculty of medicine, Sir Archibald Gray and Mr. J. Bowman Hunter.

The *William Julius Mickle fellowship*, which is of the approximate value of £250, will be awarded for the 1946–47 session to the candidate who has, in the opinion of the senate, done most to advance medical art or science within the last five years.

M.B., B.S. Degrees.—Candidates who passed the second examination for degrees in or after March, 1945, will be required to have attended not less than 30 months' course before entry for part 1, and not less than 36 months' course before entry for parts 2 and 3 of the M.B., B.S. examination.

Bethlem Royal Hospital.—The senate have with regret withdrawn the status of school of the university from this hospital.

University of Leeds

Dr. R. E. Tunbridge has been appointed to the new whole-time chair of medicine.

Dr. Tunbridge, who is 39 years of age, was educated at Kingswood School and the University of Leeds, where in 1928 he became B.SC. with first-class honours in physiology. He was appointed to a university research fellowship in physiology, and in 1929 took his M.SC. with a thesis on problems relating to the contraction of smooth muscle. He qualified M.B. with honours in 1931, and held resident appointments, including that of resident medical officer from 1933 to 1935, at the General Infirmary, Leeds. In 1933 he became M.D. and M.R.C.P. For a year he worked in Sir Francis Fraser's professorial unit at St. Bartholomew's Hospital before returning to Leeds, where he was later appointed medical tutor and reader in medicine in the university. In 1939 he went into consulting practice; his appointments included those of honorary physician to the Leeds Public Dispensary and Hospital, and consulting physician to St. James's Hospital, Leeds, and to the West Riding County Council. He served in the Army from 1941 until this year, being adviser in medicine, Malta Command, and latterly consulting physician to the B.A.O.R. with the rank of brigadier. For his services he was appointed O.B.E. in 1944, and in 1945 was mentioned in despatches. Dr. Tunbridge has written numerous papers, mainly on problems relating to diabetes mellitus, blast injury, and infectious diseases. He was elected F.R.C.P. in 1944.

University of Aberdeen

Dr. D. R. MacCalman has been appointed to the newly established chair of mental health in the university. This chair, founded in coöperation with the local authorities and the voluntary hospitals, is only the third of its kind in Great Britain. The professor will be physician-in-charge of psychological cases in the key hospitals of the area, but the administration of the mental hospitals will continue as before.

Dr. MacCalman was educated at Glasgow Academy and the University of Glasgow, where he was awarded the William Hunter medal in pathology and bacteriology before graduating M.B. in 1929. In 1933 he obtained the M.D. with high commendation. After holding appointments as house-physician at Glasgow Royal Infirmary and as assistant medical officer at two mental institutions, he went to the United States, where for a year he worked as senior resident psychiatrist under Prof. Macfie Campbell at the Boston Psychopathic Hospital, and for a further three months under Prof. Adolph Meyer at the Johns Hopkins Hospital, Baltimore. On his return in 1932 he helped to develop the Notre Dame Child Guidance Clinic in Glasgow, of which he was medical director for three years. In 1934 he became assistant physician for diseases of the nervous system at the Victoria Infirmary, Glasgow, and in 1935 he moved to London on appointment as general secretary of the Child Guidance Council and psychiatrist to the Child Guidance Clinic. In 1938 he took up his present appointments in Aberdeen as Crombie-Ross lecturer in psychopathology in the university, medical officer in charge of the department of psychological medicine, Royal Infirmary, and consultant to the local authorities of Aberdeen city and county, and the county of Kincardine. In 1944 he was appointed medical officer in charge of the department of psychological medicine, the Royal Aberdeen Hospital for Sick Children. Since returning to Scotland, Dr. MacCalman has built up a mental-health service for the treatment of minor and recoverable cases. He is the author of numerous papers, and of sections in several books. He has also written a textbook for students and general practitioners which will be published shortly.

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University of Cambridge

At a congregation on May 18 the following degrees were conferred:

M.D.—H. E. W. Roberton and D. A. Smith (by proxy); and E. V. Bevan, S. R. F. Whittaker, J. D. Fergusson, Derek Russell-Davis, N. C. Oswald, and J. S. Minett.

M.B., B.Chir.—S. R. Mawson, A. L. T. Easton, W. H. Davies, R. I. Milne, and N. K. Dryden (all by proxy).

Royal College of Obstetricians and Gynæcologists

At a meeting of the council on May 25, with Mr. Eardley Holland, the president, in the chair, the following were admitted to the fellowship:

A. C. H. Bell, J. Lyle Cameron, Mabel F. Potter, D. M. Stern; and Edward Keelan and N. W. Philpott (in absentia).

The following were admitted to the membership:

Constance L. Beynon, E. W. C. Buckell, Walter Calvert, R. G. Cross, Gilbert Dalley, Perla Greeves, Emilie E. Guthmann, W. P. Hirsch, William Kearney, A. H. C. Walker, and Margaret Weddell; and S. N. Garde (in absentia).

The council acknowledge with thanks a gift of £1000 from Sir William Fletcher Shaw to found a lectureship in memory of his son William Meredith Fletcher Shaw, who fell in Normandy in 1944, to be awarded annually to a senior fellow of the college.

At the annual general meeting of the college, held on the same day, the following were elected to council in place of those retiring by statutory rotation:

R. H. M. Corbet, A. A. Gemmell, A. J. McNair, and E. Farquhar Murray (to represent the fellows); and B. L. Jeaffreson and J. S. Quin (to represent the members).

Prof. Hilda Lloyd and Mr. L. C. Rivett have been coöpted to the council.

Postgraduate Course in Rheumatism

The Empire Rheumatism Council is holding a postgraduate course on rheumatic diseases from June 25 to 29 at the B.R.C.S. Clinic, Peto Place, London, N.W.1. Lord Horder will give the inaugural lecture on Tuesday the 25th, at 4 P.M. Tickets, for which no charge will be made, can be had from the secretary of the council, Tavistock House (N.), Tavistock Square, W.C.1.

Kettle Memorial Lecture

This lecture will be given by Prof. W. E. Gye, F.R.S., in the anatomical theatre, St. Bartholomew's Hospital Medical College, Charterhouse Square, London, E.C.1, on June 19, at 5 P.M. The subject will be Recent Advances in Cancer Research.

Royal Photographic Society: Medical Group

The Association for Scientific Photography was amalgamated with the Royal Photographic Society on March 1. The work of the association's medical group is to be continued by the society's newly formed medical photography group, of which Rear-Admiral C. P. G. Wakeley, F.R.C.S., has been elected chairman. Members of the society who are interested should communicate with Mr. E. J. Andrews, A.R.P.S., the group's hon. secretary; non-members should apply to the hon. secretary of the society, 16, Princes Gate, London, S.W.7.

Belgian Surgeon's Visit

Prof. P. Lacroix, the Belgian orthopædic surgeon, is visiting this country under the auspices of the British Council. He attended the conference of orthopædic surgeons at Newcastle-on-Tyne on May 24 and 25, and is visiting Edinburgh, Manchester, and London.

Surgery of the Hand

Dr. Sterling Bunnell, of San Francisco, consultant in hand injuries to the United States war department, will lecture on Reconstructive Surgery of the Hand, at Guy's Hospital Medical School, on June 12, at 3 P.M.

Scientific Exporters

Seven firms of scientific and surgical instrument makers have joined to form Scientific Exports (Great Britain) Ltd. to develop group-selling of their products in overseas markets. The foundation members are: Allen & Hanburys, Baird & Tatlock, W. Edwards & Co., Adam Hilger, Hopkin & Williams, W. Watson & Sons, and E. R. Watts & Son. Between them these companies offer a range of equipment which includes surgical instruments and sutures, general laboratory equipment, high-vacuum pumps and equipment, spectroscopic and other optical instruments, fine chemicals, microscopes and surveying instruments. SCIEX may be addressed at Buckingham House, Adelphi, London, W.C.2.

Course for the D.P.M.

A course of instruction, suitable for those intending to take a diploma in psychological medicine, will be held in two parts at the Maudsley Hospital in June and July, and September to November. The first part will be devoted principally to physiology, anatomy, neurology, and psychology; and the second part will be concerned mainly with the various aspects of psychiatry. Further particulars may be had from Dr. W. W. Kay, acting hon. director of the Maudsley Hospital Postgraduate Medical School, 107, Denmark Hill, London, S.E.5.

Continental-Franco-Anglo-American Medical Society

The second quarterly meeting will be held at 11, Chandos Street, London, W.1, on June 11 at 2.30 P.M., with Lord Horder in the chair.

Social Biology

The British Social Hygiene Council is to hold a summer school in social biology at Wadham College, Oxford, from Aug. 1 to 15. It is hoped that the school may help especially teachers and those concerned with social welfare. For others it is intended to throw fresh light on questions in the three planes of personal outlook, public interest, and spiritual insight.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. W. D. COLTART, F.R.C.S., 5, Wimpole Street, W.1.
Mr. G. M. FITZGIBBON, F.R.C.S., 1, Stoke Hill, Bristol, 9.
Mr. R. N. MARTIN, F.R.C.S., Norfolk and Norwich Hospital, Norwich.

ON May 24 Sir Allen Daley, medical officer of health for the county of London, was elected president of the Society of Medical Officers of Health for 1946–47.

THE death of Miss Norah March on May 21 is announced. She was for some years secretary of the National Baby Welfare Council; she was also editor of *Mother and Child* and secretary of the Health and Cleanliness Council.

Sir Alfred Webb-Johnson, P.R.C.S., has been appointed hospitaller of the Order of St. John of Jerusalem.

Prof. Harry Platt, of Manchester, is leaving for the United States to attend the annual meeting of the American Orthopedic Association as the guest of honour. During his stay in North America he will also carry out a mission on behalf of the Ministry of Health and Nuffield Trust.

THE address of the Institute for the Scientific Treatment of Delinquency is now 8, Bourdon Street, Davies Street, London, W.1. The new general secretary is Miss E. Harvey.

LEUKÆMIA TREATED WITH URETHANE.—In publishing this paper on May 11 we gave the names of the authors, on our contents page and elsewhere, in incorrect order. The paper should be cited as by Paterson, E., Ap Thomas, I., Haddow, A., and Watkinson, J. M.

STREPTOMYCIN.—According to the *Pharmaceutical Journal* for May 18, the production of streptomycin in the U.S.A. was estimated at 29,900 g. for April, an increase of 2640 g. over the March figure. Over 20,000 g. of the total was distributed for military and other government purposes, so that the amount available for research and civilian use in April was only 9465 g.

Medical Diary

JUNE 2–8

Tuesday, 4th

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. O'Donovan: Psychosomatic Dermatoses.

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE
5 P.M. (Royal Infirmary.) Mr. W. O. Kermack, D.SC., F.R.S.: Chemotherapy, Toxicity and Chemical Competition.

Wednesday, 5th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
2.30 P.M. *History of Medicine.* Dr. Douglas McKie: Joseph Black, M.D. (1728–1799).

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. Dr. G. Ewart Martin, Dr. Ion S. Hall: Treatment of the Deaf.

Thursday, 6th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. D. S. Poole Wilson: Missile Injuries of the Urethra. (Hunterian lecture.)

LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. L. Forman: Chronic Pyodermias.

EDINBURGH POSTGRADUATE LECTURES
4.30 P.M. Mr. E. A. Jack: Observations on the Treatment of Fracture of the Femur. (Honyman Gillespie lecture.)

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CARE OF THE CHRONIC AGED SICK

MARJORY W. WARREN
M.R.C.S.
DEPUTY MEDICAL DIRECTOR, WEST MIDDLESEX COUNTY HOSPITAL, ISLEWORTH

IT is surprising that the medical profession has been so long in awakening to its responsibilities towards the chronic sick and the aged, and that the country at large should have been content to do so little for this section of the community.

Today, owing to the ageing of the population, the general shortage of nurses and domestic help both for hospitals and for private homes, and the fact that more women are employed in industry, the problem has reached enormous dimensions which are still increasing. It is not confined to this country: the United States and other countries have somewhat similar facts to face. To all who have studied the subject it is obvious that the specialised care and treatment of these folk is of great economic importance and calls for immediate attention.

Though there is no accurate or precise definition of the term "chronic sick," in the minds of most people the term refers to patients over 60–65 years, who partly because of their age and partly because of the nature of their complaint require long-continued treatment before they are restored even to partial health, if indeed any recovery takes place. Broadly applied, however, the term includes all age-groups—infants and children with congenital dystrophies, rheumatic hearts, orthopædic conditions, and mental retardations; young adults with tuberculosis, incapacitating epilepsy, and progressive nervous and muscular diseases; older men and women crippled with arthritis and bedridden with incurable neoplastic conditions, and those with arteriosclerosis, cerebrovascular lesions, and senile conditions of all types, including all the degenerative conditions, from simple uncomplicated senescence to the terminal stages of senile dementia.

In this paper the age-group over 60 years is considered. There is no doubt whatever that these patients have been inadequately cared for in the past and often still receive scant attention and little if any treatment, sometimes in an atmosphere which entirely lacks sympathy with their age and condition. Some excuses for this state of affairs in former days may include the hitherto greater proportion of acute sick and the smaller number of elderly sick seeking admission to hospital, and the fact that more home assistance has been available from younger folk; but the position has now materially altered, and today the profession and the country generally have to face a population with a greater number of elderly folk and fewer young people to assist or nurse them.

TABLE I

Great Britain: Numbers aged 60 or over

Year	Men	Women	Total
1901 ..	1,071,519	1,336,907	2,408,426
1939 ..	2,511,200	3,197,400	5,708,600
1944 ..	2,737,000	3,590,000	6,327,000

U.S.A.: Numbers aged 65 or over

Year	*Number*	*Year*	*Number*
1940 ..	9,000,000	1980 ..	22,000,000

If we are to maintain the right to call ourselves a great nation and a cultured civilisation we must make provision in our scheme for all members of the community, old and young, sick and well, poor and rich, helpless and independent. With advancing years the human frame, even if healthy, cannot maintain the same speed or withstand the same strain as in earlier years, especially if it is handicapped by disease or accident, when additional aids may be needed.

In table I the numbers of men and women in Great Britain aged 60 and over are set beside figures for the U.S.A.

It will be seen that in this country between 1901 and 1944 the gross figures multiplied roughly by 2·5—i.e., from about 2½ million to 6¼ million—and a similar rise is foretold in the U.S.A. between 1940 and 1980.

Table II shows the increase in the expectation of life.

TABLE II—EXPECTATION OF LIFE

Great Britain			*U.S.A.*		
Year	Men	Women	Year	Men	Women
1891–1900	44·1	47·8	1900–02	48·23	51·08
1901–10	48·5	52·4	1940 ..	62·94	67·31
1942 ..	61·7	67·4			

There are more women than men in all hospitals and institutions catering for the sick, unless they are especially selected. This is due to the higher average age in women and to the fact that men can often be nursed at home by their womenfolk. Among the reasons for the increase in the number of elderly folk are the progress in preventive medicine, industrial welfare, and welfare of all classes of the community; the fall of the birth-rate; and the shortage of help of all kinds attendant on a major war.

The medical profession, having succeeded in prolonging the life of men and women, must no longer fail in its responsibility to the elderly when they fall sick or become infirm. Wherever possible, they should be retained in, or returned to, their own homes, provided there is sufficient help for their comfort and welfare, and that the home conditions are suitable. But many elderly and chronic sick will have to remain in a hospital or a home—and such cases must be carefully classified so that they may best be diagnosed, treated, and finally housed. The diagnosis should be made and treatment undertaken in specially built and equipped blocks of a general hospital. Only after all possible treatment has been given, and the social background carefully studied, should a patient be admitted to a home. Such homes, which should in every case be attached to general hospitals, should be carefully chosen in the best interests of each patient, with due regard to not only the physical condition but also the mental capacity. In this connexion it must be appreciated that in future a larger proportion of patients will be drawn from the professional classes.

THE UNTREATED CASE

A brief description of untreated cases will not be out of place here; for only those who have had charge of such patients can know anything of their misery and degradation.

Having lost all hope of recovery, with the knowledge that independence has gone, and with a feeling of helplessness and frustration, the patient rapidly loses morale and self-respect and develops an apathetic or peevish, irritable, sullen, morose, and aggressive temperament, which leads to laziness and faulty habits, with or without incontinence. Lack of interest in the surroundings, confinement to bed, and a tendency to incontinence soon produce pressure sores, with the necessity for more nursing, of a kind ill appreciated by the patient. An increase in weight, especially in the anterior abdominal wall, and an inevitable loss of muscle tone make for a completely bedridden state. Soon the well-known disuse atrophy of the lower limbs, with postural deformities, stiffness of joints, and contractures, completes the unhappy picture of human forms who are not only heavy nursing cases in the ward and a drag on society

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but also are no pleasure to themselves and a source of acute distress to their friends. Still, alas, in this miserable state, dull, apathetic, helpless, and hopeless, life lingers on sometimes for years, while those round them whisper arguments in favour of euthanasia.

GERIATRICS AS A SPECIALTY

There is much to recommend geriatrics as a specialty, comparable to pædiatrics. The creation of such a specialty would stimulate those with a leaning to this type of work and raise the standard of the work done. This branch of medicine forms an important subject for the teaching of medical students and should form part of their curriculum, and the care of chronic sick patients should also be an essential part of the training of student and assistant nurses. Research into the diseases which accompany advancing age should be encouraged and undertaken.

For the proper care and rehabilitation of these patients, the full facilities and stimulating atmosphere of a general hospital are necessary both for the establishment of a correct diagnosis and for full treatment. In the past the chronic patient has been frowned on almost everywhere: many hospitals have not accepted such cases, and others have received them but given little or no treatment. It is not enough that medical students should merely be shown chronic patients; they should see them under treatment and watch their seniors manage such cases from the beginning to the end. Without such tuition there is no hope that future generations will be any more knowledgeable in the care of these patients than is the average doctor today. While such cases, still needing treatment, can easily be transferred to an institution, there is no incentive on the part of the physician to treat them. The lack of facilities in the institution render full treatment there impossible—and so another bed becomes blocked by a treatable patient.

The case for student and assistant nurses in training is equally indisputable, for the skill required in nursing such cases really well can only be learnt under supervision at the bedside, and from among such nurses only can be drawn later the trained staff required to take nursing charge and teach the next generation of nurses.

Innumerable examples could be given of the deplorable results of lack of initiative in chronic wards, with blocking of beds and deterioration of patients. Those who interrogate patients evacuated during the war from hospitals, where they were receiving treatment and aids in getting about, to institutions for the chronic sick will hear pathetic stories, which will often be confirmed by senior officers. Though it is most unlikely that an institution for the chronic sick will be so well equipped as a general hospital, with radiological departments, pathological laboratories, research units, and the services of consulting medical staff, almoners, physiotherapists, and occupational therapists, there seems to be no reason against including a special geriatric unit as part of a general hospital in the same way as a pædiatric section, a pulmonary tuberculosis block, and orthopædic, ophthalmic, and psychiatric wards.

Further, elderly chronic sick patients needing, as they almost always do, a long stay in hospital should be treated in a hospital serving their own district and not, as has sometimes been advocated, in quieter or more remote districts. The amenities of the country are not appreciated by lifelong town-dwellers, and it is important that there should be easy access for visiting, particularly for their contemporaries, who are often the visitors most wanted. It should be possible to visit frequently and easily, as well as cheaply, and this is often impossible as soon as one leaves the centre of London and other large cities, and journeys become intricate and tedious for even the healthy elderlies, and very irksome for the crippled and infirm.

CLASSIFICATION OF AGED CHRONIC SICK

The aged chronic sick are divided into those who can remain at home or go home, and those who cannot do so. The latter can be subdivided thus:—

(1) Those who are up and about—fit for a home with full freedom.
(2) Those who are sedentary or partially ambulatory and would be happier in a home with suitable provision—e.g., lifts, bungalows, &c.
(3) Those who must remain preferably in a hospital as opposed to a home:—
  (*a*) Those who need much help and little trained nursing and medical supervision—e.g., patients too frail or incapacitated for a home.
  (*b*) Those who need much nursing and some medical attention—e.g., advanced neoplastic conditions and decompensated hearts, &c.
  (*c*) Those who need full nursing and medical care: sick patients of all kinds; incontinents; patients who require some restraint in cot beds and segregation from general patients, owing to restlessness (early cerebral thromboses), and senile dements, separate from certified patients.

Classes (1) and (2), living in a home for aged chronic sick, will need a doctor on call, a trained nurse in charge, and nursing attendants. Of those living in a hospital, class (*a*) will need assistant nurses and nursing orderlies under trained staff; class (*b*) assistant nurses and student nurses under trained staff; and class (*c*) a full nursing staff. For all in class (3) a daily visit of a medical officer and regular full medical rounds should be arranged.

REHABILITATION

To prevent the sequence of events described above in connexion with untreated cases, much can be done even when full rehabilitation is impossible. The treatment of these long-stay cases should be undertaken by a team whose central theme is optimism and hope. This team should include medical and nursing staff, and wherever possible medical and nursing students, together with physiotherapists, occupational therapists, and medicosocial workers. The help of medicosocial workers is invaluable in supplying the social background and helping the patient in his return to home or friends—not to mention the attention to innumerable problems encountered during a prolonged stay in hospital.

Long-stay patients, when bedridden, should not be kept in one bed in one position in the ward too long, and a change of ward from time to time is also beneficial, as it provides an interest in new surroundings and new people.

As early as possible a patient should be encouraged to take a healthy and creative interest in his progress, to play a part in his recovery, and to help other patients. It is wise to get elderly folk up as soon as their physical condition warrants, and it is of great value to their morale to get them dressed in their own clothing as soon as possible.

Wireless with head-phones (not loud speaker) and other forms of occupational and diversional therapy all play their part in the recovery and rehabilitation of the patient.

The general lines of approach must be to demonstrate that, though such patients need longer treatment, the time being measured in months rather than weeks, much can be done for their betterment, both physical and psychological. A kindly discipline from which all unnecessary red tape has been removed, and an intelligent understanding of, and interest in, them as individuals, will do much to create a receptive background, without which much medical and nursing treatment will fail to be effective.

Sometimes it may be necessary to educate a patient to a slower tenor of life, reminding him that he must not expect to do the same at 75–80 as he did 20–30 years earlier.

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EQUIPMENT FOR GERIATRIC WARDS

Much attention should be paid to the equipment required for such wards, and additional amenities should be provided for the extra comfort of such elderly patients.

Wards set aside for the treatment of these patients should be suitably planned with sufficient side wards for patients who require isolation, for those who are dying, and for other purposes. Floors should not be highly polished, and steps should be avoided. Good lighting is essential, from the point of view of both comfort and safety. There should be additional handrails in the ward and annexes, and plenty of armchairs of different types, suited to the various medical conditions—e.g., high chairs with high backs for arthritics, low chairs for heart cases, and more heavily built chairs for recovering hemiplegics—together with an ample supply of cushions for their comfort and relaxation. Sticks used in these wards should always be provided with rubber ferrules. Additional attendant staff is helpful in wards where patients are beginning to get up and are being actively rehabilitated. Extra linen must be supplied for incontinent patients. Specially prepared food for the edentulous promotes interest in the diet and prevents waste. Meat should be minced, and vegetables, particularly greens, should be made into a purée.

PLANS FOR THE FUTURE

If plans for the future could be made on these recommendations, the work would prove interesting to medical staff, satisfying to nursing staff, and very beneficial to the patients. The inclusion of the geriatric unit in a general hospital, with all modern facilities and the necessary staff for investigation, consultation, and treatment, would raise the standard of work done, shorten the time of stay in hospital, and avoid the unnecessary blocking of beds by patients who could be treated sufficiently to return to their own homes or enter a home.

To those who feel that such work must inevitably lack interest the suggestion is made that they should give it a trial, under as ideal conditions as possible, for not less than a year. Though the work, conscientiously done, is both absorbing and tiring, it is intensely interesting and very satisfying. Some of the best nursing staff who have not previously come into touch with such work become extremely interested in it and many, finding that it calls for their best efforts, become very keen and highly efficient members of the therapeutic team, inspiring junior nursing staff and newcomers to the ward. As, however, many nurses tend to take their cue from the attitude of the medical staff towards such work, it is important that the medical officer should remain enthusiastic and resourceful, and should try to inspire the team.

A change of attitude to the care and treatment of the chronic sick is urgently needed, and members of the medical and nursing staff everywhere should give this subject their very deep reflection.

SUMMARY

There should be a change of attitude on the part of the medical profession towards the care of the chronic sick. When this is established, the change will be reflected in nursing and other hospital staff.

A higher standard and a great deal more work is needed in the care of the chronic sick.

The creation of a specialty for geriatrics would stimulate better work and initiate research.

The chronic sick should be diagnosed and treated in special blocks of a general hospital set up and equipped for the purpose.

Chronic aged sick should be admitted to homes only through hospital units.

All homes for chronic sick should be attached to hospital units to ensure close follow-up work.

SEGMENTAL RESECTION OF LUNG FOR BRONCHIECTASIS

ROBIN PILCHER
M.S. Lond., F.R.C.S.
PROFESSOR OF SURGERY, UNIVERSITY OF LONDON; DIRECTOR OF SURGICAL UNIT, UNIVERSITY COLLEGE HOSPITAL

WHEN the surgical treatment of bronchiectasis in children was started in this unit, it was decided that the dissection technique should be used whenever possible, and for this the lobe was regarded as the smallest suitable unit of lung tissue.

The lingula, which is often selectively involved, was regarded as a lobe, analogous to the right middle, and was removed with conservation of the rest of the upper lobe when this was healthy. To remove the lingula it is necessary to dissect an intersegmental plane, as this segment has only a shallow fissure demarcating it from the rest of the upper lobe. As was pointed out by Churchill and Belsey,[1] lingula lobectomy is in fact a segmental resection and as such is already common practice. Moreover during the removal of whole lobes by the dissection technique it is often necessary to separate partially fused lobes when the fissures are shallow.

In view of the practicability of segmental resection of the lingula and of lobectomy of fused lobes there seemed no reason why segmental resection should not be applied to other parts of the lungs. Hitherto cases had only been accepted for surgery when two lobes were free of disease; and, although in several cases the whole of the left lung and the right middle lobe have been removed, subsequent review of these and other extensive resections showed that there had been some sacrifice of healthy tissue which ought, if possible, to be preserved. Improvements in bronchography have made it possible to determine not merely the lobar but also the segmental distribution of disease, and cases have been seen in which there was bronchiectasis in all lobes, and yet several segments appeared to be unaffected. The early policy of selecting cases for surgery on the basis of lobar distribution would have excluded these, and it was therefore decided that selection should be made on a revised basis of segmental distribution. This policy has now been followed for two years, and the results have been such as to warrant a preliminary report of experience with this type of operation. No originality is claimed for the method, which was suggested to us by Churchill and Belsey and has also been favourably reported by Blades.[2] The first application of the method other than in lingula resection was conservation of the dorsal segment of the lower lobe, and from this beginning the method has been developed to operation on all five lobes in one patient (case 2).

MATERIAL AND METHOD

Excluding cases of lingula resection, the segmental operation has been done on 10 children, and on one of them three segmental resections were done, making twelve in all. There has been no mortality and no more morbidity than after dissection lobectomy. The patients were all children aged 7–12 years, and all had bilateral bronchiectasis, making conservation of healthy tissue an important aim. It was anticipated that segmental resection would carry an added risk of sepsis, hæmorrhage, and perhaps tension pneumothorax, but these complications have not arisen, and the postoperative course has been as smooth as after lobectomy. This no doubt lends interest to details of technique in the actual operation, but the absence of mortality and morbidity is in great measure due to preoperative and postoperative care of the child. In both, the chief source of anxiety is the excessive bronchial secretion. Pre-

1. Churchill, E. D., Belsey, R. *Ann. Surg.* 1939, **109**, 481.
2. Blades, B. *Ibid*, 1943, **118**, 353.

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operatively the child has a prolonged course of postural drainage and breathing exercises, and an attempt is made to clear infection in the nose, throat, and ears. After operation every effort must be made to induce natural expectoration; and, if this fails, bronchoscopic aspiration is carried out. As after lobectomy, the most important postoperative complication is persistent or recurrent atelectasis of residual lung, and bronchial obstruction is the only recognised cause. It is not always easy to recognise segmental atelectasis after operation, especially if there is any residual effusion, and re-expansion is therefore checked by bronchography a few weeks after operation. This step is also of value to confirm the removal of all the diseased segments.

Whatever the merits of artificial pleural symphysis for lobectomy, a free pleura is an advantage in segmental resection. It facilitates palpation of the lung to confirm the extent of the disease and to find the segmental bronchus at its origin. In this series palpation of the lung has been of great value in the recognition of diseased segments and has sometimes revealed small segments of disease not outlined in the bronchogram. The complete atelectasis of bronchiectatic segments and the accompanying emphysema of unaffected segments modify their relations and make difficult the correlation of the bronchogram with the appearances in the opened chest. Moreover, during the dissection of the intersegmental plane, which is occupied by veins draining adjacent segments, bleeding may be free, and it is useful to be able to control this by holding up the lobe and compressing it lightly with the fingers.

Before operation is started the bronchi are cleared by suction through a bronchoscope, and provision is made for suction if necessary during operation. When the disease affects all lobes, there is no way of preventing spill-over of secretion during operation, and it is almost impossible to avoid some compression of the lung during the dissection. Arrangements to meet this emergency have not always been satisfactory, and on more than one occasion operation has had to be interrupted to carry out bronchoscopy and aspiration. Aspiration through the bronchoscope is always repeated at the end of operation, even if the airway appears to be clear. The final bronchoscopy also serves to make sure that bronchi to conserved segments have not been narrowed by the bronchial ligatures. Recently, at the suggestion of Dr. Massey Dawkins, who has given the anæsthetics for these cases, the bronchoscope has been left in the trachea during operation and the anæsthetic given through the side tube with the main opening blocked. It is then a simple matter to aspirate secretion if spill-over takes place during operation. During the initial bronchoscopy an intravenous drip is set up in leg or arm, and blood is available if needed. This is a routine precaution for all lung resections but is more important for segmental resection as blood-loss is greater than in lobectomy or pneumonectomy.

Operation.—The chest is opened through an intercostal incision, and in children rib resection has been unnecessary. When the chest is open, the next step is careful inspection and palpation of the lung to confirm the extent of the disease and decide the extent of resection. If segmental resection of more than one lobe is indicated, it may be advisable to do the operation in two stages with about a fortnight's interval. This was done in two cases, and the second stage presented no difficulties. It is desirable to isolate and close the bronchus early to control its secretion during the separation of the segment, but it is necessary to divide branches of the pulmonary artery before the bronchus can be adequately exposed. Veins can usually be left until after the bronchial closure. When the bronchus of the segment has been cleared it is ligatured with stout silk as close to its origin as possible without deforming other bronchi, and test inflation of the residue of the lung checks the correct placing of the ligature. Inflation after bronchial ligature also serves to demarcate the segment for resection from the rest of the lobe and simplifies recognition of the intersegmental plane. This, however, can often be seen on the surface by a difference in degree of aeration without inflation and in the depth of the lobe is recognised by palpation round the bronchus. The surface of the lobe is incised along the intersegmental plane, but at this stage the incision is made only through the visceral pleura. Separation of the diseased segment from the rest of the lobe is begun either peripherally or in the hilum and is effected mainly by blunt dissection with small gauze mops. In some cases the dissection has been easy and clean, in others difficult and ragged. The intersegmental plane is recognised by the presence of the large intersegmental vein and its tributaries and by the ease with which the separation can be made. Many small veins running from the segments to the intersegmental trunk have to be divided, and they are either ligatured with fine thread or closed with Cushing clips. When the intersegmental dissection is complete, the bronchus is divided between a clamp and the previously placed ligature. Sometimes the bronchial stump has been covered with a pleural flap, but this step has not been routine, and its value in segmental resections is doubtful. The raw surface of the residue of the lobe is then examined for bleeding-points and, if bleeding is troublesome, temporary arrest is easily maintained by gentle compression of the cut surface. No attempt is made to suture the raw surface of the lobe or to cover it with pleura.

The best safeguard against postoperative complications seems to be rapid obliteration of the pleural cavity by re-expansion of the residual lung. Suturing and pleural grafting, as described by Blades, besides taking longer, must restrict the overexpansion necessary to fill the place of the resected segments, and in extensive resections this is an important consideration. In most cases in this series, however, the raw surface has been coated with fibrin formed in situ from fibrinogen and thrombin solutions.[3] This rapidly completes hæmostasis, and it was thought it would also provide an adequate seal for any small bronchioles opened during the dissection. It is impossible to say whether this step is of any real value except as a means of hæmostasis, but certainly no ill effects have followed the omission of a pleural covering for the raw areas. During the handling of the lobe for the intersegmental dissection it is difficult to avoid collapse of the residual portion of the lobe, and after the removal of the segment and the treatment of the raw surface reinflation is attempted by the anæsthetist and, if successful, maintained during closure of the chest. If reinflation does not readily follow slight pressure, it is assumed that there is some bronchial obstruction by secretion and, if this cannot be aspirated by the anæsthetist, the chest is closed with the lobe collapsed, bronchoscopic aspiration and withdrawal of air from the pleura being done after closure.

Penicillin 100,000 units in saline is put in the pleura, and the chest is closed without drainage. No other routine chemotherapy is used. Closure is done in layers with fine silk and is nearly airtight: it is possible for residual air to escape from the pleura into the chest wall, but no air can be sucked in through the wound. Occasionally in children a fine intercostal catheter is inserted for postoperative aspirations, but this is kept spigoted and does not act as a drain. After closure of the chest the bronchi are cleared of secretion, and those which were adjacent to segments which have been removed are inspected to make sure there is no narrowing. The bronchoscope is then removed and, if it is thought necessary, the pleural pressure is adjusted, but this

3. Obtained from the Lister filtration unit of the Medical Research Council, whose help is gratefully acknowledged.

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step is omitted if there has been good re-expansion during closure.

After operation the child is transferred to an oxygen tent, where he remains until the next morning, after which oxygen has not been used. Treatment in the first few days after operation is mainly determined by radiography. Fluid may require aspiration, and sometimes bronchoscopy is done if re-expansion is slow, but every effort is made to encourage natural expectoration. In this small series the postoperative course has been smooth, and there has been no persistent atelectasis or empyema. It was expected that the large raw surfaces left after segmental resection would cause trouble, but this has not been the case. The only serious complication arose in case 6, the child nearly dying of asphyxia during operation and suffering what may prove to be permanent cerebral damage.

For the satisfactory performance of segmental resection a knowledge of bronchial anatomy is obviously necessary; but, though it may be easy to define the extent of disease in a good bronchogram, it is not always easy to correlate the findings at operation with those on radiography. Familiarity with the surface markings and shape of normal segments is not enough, since the relations are modified by selective collapse and compensatory emphysema. The common variety of collapse of the basal segments of the lower lobe with emphysema of the dorsal segment is a good example of this modification and was certainly not recognised for what it was in some of the earlier lobectomies done in this unit. The arrangement of segmental branches at their origin is subject to variation, but here the bronchogram should help recognition, and it should always be available at the time of operation. If the bronchus is ligated before the intersegmental dissection is begun, inflation will clearly demarcate the area of lung which it supplies. If one could always be sure of correct placing of the bronchial ligature, this would be a satisfactory way of recognising the area to be removed, but hilar dissection may be very difficult if there is much lymphadenitis, and the segmental bronchus may in error be ligatured distal to a bifurcation, the result being that one branch is missed. Sometimes accessory fissures may be present which appear to demarcate the area of disease, but it is a mistake to rely on these, as they may be subsegmental and therefore within the area of disease. For these reasons it has been found useful to determine the area to be removed by palpation as well as by the appearance of the bronchogram. This is particularly useful if the bronchogram is not perfect and may allow recognition of diseased segments not outlined by the 'Lipiodol.'

CASE-RECORDS

CASE 1.—A girl, aged 10 years, with bronchiectasis of lingula, right middle lobe, and basal branches of right lower lobe.

Sept. 28, 1943: resection of lingula. Sulphanilamide in pleura. Straightforward recovery.

March 14, 1944: right middle lobectomy, segmental resection of right lower lobe, with conservation of dorsal segment. Spigoted intercostal catheter, no chemotherapy. Rapid re-expansion of right upper lobe. Some delay in re-expansion of dorsal segment.

CASE 2.—A girl, aged 12 years, with bronchiectasis of all five lobes.

Nov. 9, 1944: right middle lobectomy and resection of pectoral segment of right upper lobe. Penicillin in pleura. Rapid re-expansion.

Nov. 23, 1944: segmental resection of right lower lobe, with conservation of dorsal segment. Penicillin in pleura. Delayed re-expansion of dorsal segment subsequently shown by bronchogram to be complete.

Jan. 3, 1946: resection of lingula and part of pectoral segment of left upper lobe, resection of basal part of left lower lobe, with conservation of dorsal segment. Raw surfaces coated with fibrin. Penicillin in pleura. Rapid re-expansion of upper lobe. Delayed re-expansion of dorsal segment.

CASE 3.—A boy, aged 9 years, with bronchiectasis of left lower lobe and lingula, right middle lobe, and cardiac segment of right lower lobe.

Jan. 25, 1945: right middle lobectomy and resection of cardiac segment. Penicillin in pleura. Rapid re-expansion.

Dec. 13, 1945: left lower lobectomy and resection of lingula. Raw surface coated with fibrin. Penicillin in pleura. Delayed re-expansion.

CASE 4.—A girl, aged 7 years, with bronchiectasis of left lower lobe, right middle lobe, and cardiac segment of right lower lobe.

April 16, 1942: left lower lobectomy. Sulphanilamide in pleura. Rapid re-expansion.

Feb. 8, 1945: right middle lobectomy and resection of cardiac segment. Penicillin in pleura. Delayed re-expansion of lower lobe.

CASE 5.—A boy, aged 10 years, with bronchiectasis of left lower lobe and lingula and branches of right lower lobe not identified clearly in bronchogram.

Feb. 15, 1945: resection of cardiac segment and what appeared to be another subsegment of lower lobe partly demarcated by a fissure. Disease identified by palpation. Penicillin in pleura. Delayed re-expansion.

Oct. 4, 1945: left lower lobectomy and resection of lingula. Raw surface coated with fibrin. Penicillin in pleura. Delayed re-expansion.

CASE 6.—A boy, aged 11 years, with bronchiectasis of left lower lobe and lingula and right lower lobe.

June 21, 1945: operation on right side started but abandoned owing to difficulty of controlling bronchial secretion.

Sept. 14, 1945: segmental resection of right lower lobe, with conservation of dorsal segment. Raw surface coated with fibrin. Penicillin in pleura. Rapid re-expansion. Operation was interrupted for bronchoscopy owing to asphyxia by spill-over. Heart stopped and was restored by massage. There was delayed recovery of consciousness, with spastic quadriplegia. This has improved, but there was still serious disability when the child was last seen.

CASE 7.—A boy, aged 9 years, with bronchiectasis of left lower, right middle, and right upper lobes.

June 28, 1945: right middle lobectomy and resection of axillary part of pectoral segment of right upper lobe. Raw surface coated with fibrin. Penicillin in pleura. Slight delay in re-expansion. Awaiting operation on left side.

CASE 8.—A girl, aged 7 years, with bronchiectasis of left lower lobe and lingula, right middle lobe, and part of right upper lobe. Right upper lobe not detected in bronchogram, which was done a year before operation.

Oct. 4, 1945: right middle lobectomy, segmental resection of pectoral segment of right upper lobe. This was recognised by palpation, not having been suspected before operation. Raw surface coated with fibrin. Penicillin in pleura. Rapid re-expansion. Postoperative bronchogram shows suspicion of bronchiectasis in basal branches of right lower lobe. Awaiting operation on left side and may require further resection on right.

CASE 9.—A girl, aged 10 years, with bronchiectasis of right middle and lower lobes, lingula, and cardiac segment of left lower lobe. Cardiac segment not shown in bronchogram.

Nov. 8, 1945: resection of lingula and cardiac segment of left lower lobe. The cardiac segment had a well-defined fissure. Disease in this segment not shown in bronchogram was recognised by collapse and induration. Raw surfaces coated with fibrin. Penicillin in pleura. Rapid re-expansion. Awaiting operation on right side.

CASE 10.—A boy, aged 10 years, with bronchiectasis of right middle, right lower, and left lower lobes.

Oct. 25, 1945: right middle lobectomy. Penicillin in pleura. Rapid re-expansion.

Nov. 20, 1945: resection of cardiac and anterior basal segments of right lower lobe. Raw surface coated with fibrin. Penicillin in pleura. Rapid re-expansion. At operation findings did not appear to conform to bronchogram owing to distortion by collapse and emphysema. Resection guided by palpation. Postoperative bronchogram showed that diseased segments had been removed.

It appears on review of these cases that in some the interval between bronchogram and operation has been too long, and there may have developed in the interval

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areas of disease which were not present before (see case 8). The surgical treatment cannot be planned until the bronchograms are completed; but, if operation has to be deferred more than six months, it would be advisable to repeat them and to look for extension of the disease. This is particularly indicated before operation on the second side in a bilateral case. How reliable palpation is has yet to be shown, but so far all segments removed on this indication have proved to be bronchiectatic. In children there seems to be more peribronchial inflammatory tissue than in adults, and in adults palpation has been less helpful. For purposes of description it is unfortunate that bronchial nomenclature is not standardised, but it has to be admitted that in this small series some segments or subsegments have been removed which could not be named with certainty according to any system.

SUMMARY

Segmental resection of the lung widens the scope of surgery in extensive bronchiectasis and minimises the sacrifice of healthy lung.

The operation carries no greater risk than does lobectomy.

In children palpation is a useful aid to recognition of diseased segments, and for this a free pleura is an advantage.

The operation has been done in 10 cases, which are briefly reported.

CROHN'S DISEASE

REPORT OF TWO CASES

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CROHN'S disease is characterised by morbid changes in the neighbourhood of the ileocæcal junction with tumour formation affecting the neighbouring bowel. These changes, by causing gradually increasing stenosis, produce a clinical picture of progressive subacute obstruction of small intestine.

Before Crohn[1] drew attention to it in 1932, it had been attributed to various causes, such as tuberculosis, neoplasm, actinomycosis, and gumma. Cases examined histologically were usually attributed to tuberculosis, because the sections showed a low-grade inflammation with giant cells. Cases have often been described in which sinuses have formed between the affected bowel and neighbouring loops. Also cases have been described in which the affected bowel was far removed from the ileocæcal region. Crohn regards the origin of the trouble to be situated in the ileum and called the condition regional ileitis.

CASE-RECORDS

CASE 1.—A married woman, aged 37, complained of increasing "indigestion" and abdominal discomfort for about 2 months. Lately she had vomited frequently, had no taste for food, and been obstinately constipated. Opening medicines produced watery diarrhœa accompanied by much straining. Of late she had had a good deal of pain in the right lower abdomen. During the last few days she had become much worse, with more vomiting and more pain, and felt that she could go on no longer.

Her skin was sallow and she gave the impression of having lost weight. Her tongue was thickly coated and the breath fetid. Temperature 100° F, pulse-rate 100 per min. The abdomen still had a fair amount of fat, although this appeared to have diminished. It moved poorly and was distinctly tender to palpation in the region of the umbilicus and right iliac fossa. On deep palpation an indistinct mass could be felt in the right lower quadrant.

The most probable diagnosis was thought to be a chronic appendix abscess with enclosing omental adhesions. In view of the recent increase in severity, together with the fever, &c., immediate operation was recommended, and she was admitted to a nursing-home forthwith. Several hours later she was operated on under ether anæsthesia. Under the anæsthetic the mass was more distinct and was found to be somewhat mobile.

The abdominal cavity was opened through a transrectal incision approximately over the palpated mass. There was a small amount of free clear fluid, and the mass at once presented itself. It was mobile, easily delivered, and proved to consist of the cæcum, ileocæcal junction, and about 3 in. of ileum, together with the appendix. The tumour had the appearance of an irregular cylinder, 4 in. long by 2¼ in. in diameter, in which the identity of the component parts was just obvious. The demarcation between tumour and normal bowel was fairly clearly defined at either end. The surface of the mass was bright pink, very vascular, and roughened. It was hard but somewhat resilient, like solid rubber. The mesentery associated with the mass was studded with enlarged glands, which were not stony hard and had not undergone calcification or caseation. There was little about the remaining abdominal contents that was abnormal. The walls of the small intestine gave the impression of hypertrophy, and it was a little distended but not unduly so. The omentum was perfectly free, and there were no adhesions. There were no glands palpable in any other part of the mesentery than that already referred to. The liver was not enlarged, and such of its surface as could be felt was smooth.

Since the mass was thought to be a neoplasm, the most desirable procedure was to excise it and make a short circuit. Owing to the absence of the necessary clamps it seemed wise to be content with performing an anisoperistaltic ileocolostomy between a piece of ileum about 8 in. proximal to the mass and the proximal half of the transverse colon. This was done without clamps, the wound being closed without drainage, and the patient was returned to bed. She made an uninterrupted recovery, her symptoms being relieved from the very beginning, and the situation was explained to her and her husband.

Six weeks later she returned to the nursing-home for excision of the tumour. It was noted at this operation that even under anæsthesia no tumour was palpable. The abdomen was reopened, the old scar being excised, and an apparently normal cæcum and adjacent parts were delivered. Everything, except a protecting omental adhesion to the short circuit, was in order. The appendix was removed and the abdomen closed.

It was naturally assumed that the condition had been due to a mild inflammation, stimulated and maintained by irritation at the ileocæcal junction, and that, this irritation having been removed, the condition had resolved in the space of 6 weeks.

There is a sequel to this case. Five years later the patient, now aged 42, began to have metrorrhagia, and it was considered necessary to perform a total hysterectomy. It was therefore possible once more to explore the abdominal cavity, when it was found that there had been no further change. Two years after this last operation the woman was in good health.

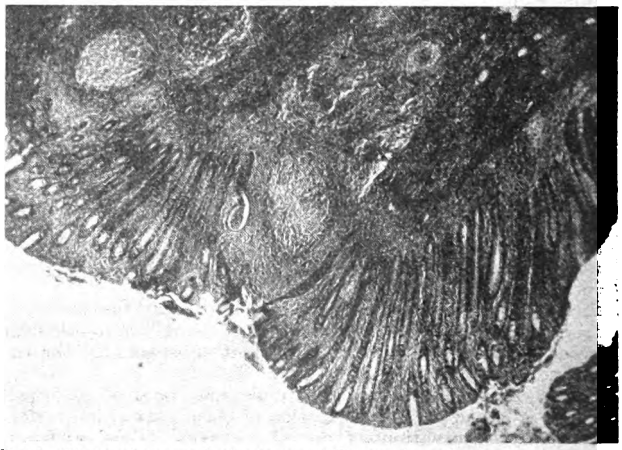

Fig. 1—Photomicrograph of mucosa of ileum of case 2, showing infiltration with small round cells. (× 20.)

1. Crohn, B. B., Ginzburg, L., Oppenheimer, G. D. *J. Amer. med. Ass.* 1932, **99**, 1323.

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CASE 2.—A married woman, aged 23, complained of nausea and abdominal pain, becoming increasingly severe, for 6–8 weeks. She was badly constipated. The tongue was coated, and she looked pale and ill. She had not been able to retain any food for 24 hours and had only passed a little "slime" from the bowel. Temperature 99·6° F, pulse-rate 112. Although the abdomen was "on guard," a mass was felt on the right side just below the umbilicus. It had some degree of mobility and felt like a prolapsed kidney, except that it was too irregular and could not be moved into the loin. Crohn's disease was suggested but dismissed in favour of the more usual omental collection round an inflamed appendix. She was admitted to the Victoria Infirmary, Northwich.

Operation was performed under ether anæsthesia. Entrance was made by a right pararectal incision directly over the mass. A small amount of free fluid escaped as the peritoneum was opened, and the tumour presented and was easily delivered. It consisted of cæcum, ileocæcal junction, and some 4 in. of ileum. The appendix was lying free of the general mass but was in the same thickened condition. The mass was roughly L-shaped, the short limb corresponding to the ileum and the long limb to the cæcum and the adjacent affected ascending colon. The long limb was about 5 in. long and 2 in. in diameter, while the short one was about 3 in. long and 1½ in. in diameter. The line of demarcation was fairly well defined in both cases. The whole tumour was uniformly pink, vascular, and rough. It had the same rubbery hardness described in case 1. The local mesentery was freely studded with tense glands, which showed no signs of calcification or caseation.

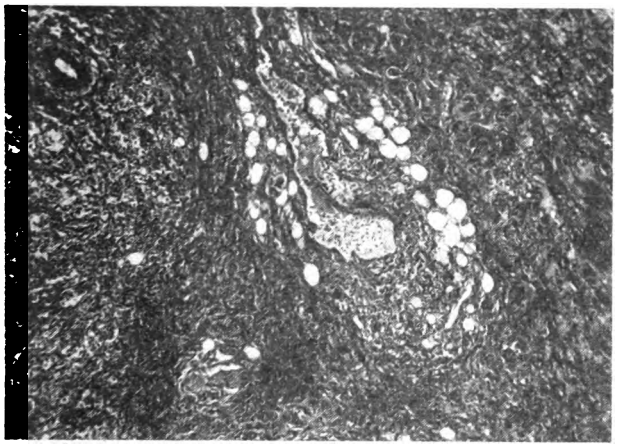

Fig. 2—Photomicrograph of submucosa of ileum of case 2, showing infiltration with small round cells. (× 44.)

It was realised that this was a case of Crohn's disease, and because of the former experience there was some hesitation about whether the tumour should be excised or a simple ileocolostomy done. In view of the current teaching by Crohn, Hurst, and others—that short circuit is not usually sufficient—it was decided to perform excision. The ileum and ascending colon were therefore divided some 3 in. from the demarcation lines after crushing. The divided ileum was ligatured and peritonised, and the colon was closed with a line of sutures and likewise buried. An anisoperistaltic side-to-side ileocolostomy between a loop of ileum about 8 in. proximal to the division and the proximal half of the transverse colon was then made, Moynihan's gastro-enterostomy clamps being used for light hæmostatic pressure. Before closure of the wound a soft tube was introduced into the pouch of Douglas. The patient was returned to bed in good condition and later made an uninterrupted recovery. She was given sulphamethazine 1 g. 4-hourly as soon as she had reasonably recovered from the anæsthetic; it caused no vomiting whatever.

When the excised mass was cut open, it was seen that the mucosa of the lumen was ulcerated, especially near the ileocæcal valve. The ulcers appeared to affect the mucous and submucous coats, and the bases were hæmorrhagic. The walls were thickened and on section gave the impression of being the site of tense œdema rather than that the swelling was composed of new cellular elements or fibrous tissue. The lumen of the ileocæcal valve would scarcely admit the points of a pair of scissors.

Fig. 3—Photomicrograph of peritoneal surface of ileum of case 2, showing infiltration with small round cells. (× 20.)

Histological section showed much small round-cell infiltration, especially in the mucous and submucous layers, with giant-cell formation (see figs. 1–3). Dr. C. S. Anderson expressed the opinion that, since there was no caseation, the condition was Crohn's disease.

COMMENTS

The close similarity of these two cases, as regards both history and findings at operation, leaves no doubt that they were examples of Crohn's disease.

In case 1 short-circuiting of the lesion was an adequate remedy, the lesions resolving completely and permanently. It seems therefore that the stimulating and maintaining cause of the condition is the passing of fæces over the affected area. The only peculiarity of this portion of gut is the presence of the ileocæcal valve, and it is therefore in this structure that we can logically seek the cause. Possible morbid conditions of the valve are congenital or acquired stricture and ulceration. The whole clinical picture seems to be analogous to that holding at the pylorus in pyloric or duodenal ulcer. Just as simple gastro-enterostomy without excision has undoubtedly cured duodenal ulcer, so simple short circuit without excision will cure some cases of Crohn's disease. Cases which are not cured—and many such have been described—are perhaps badly infected by absorption through the ulcerated areas or are due to entirely different causes, such as tubercle, actinomycosis, or neoplasm.

If it is possible for a surgeon to judge that short circuit without excision will be enough, surely it is desirable in selected cases to perform the simpler operation, since the operative risk is then considerably less and the terminal portion of the ileum is left to function, which, as the last 12 in. or so of ileum is perhaps the most important part of the whole gut, is much to be desired.

In case 2 it was possible to examine the tumour both with the naked eye and microscopically. A point worthy of note in both cases is the discreteness of the tumours. In neither case was there the slightest effort of surrounding structures to become adherent to the tumour; even the omentum was indifferent. Apparently at the time of operation the inflammation extending from within did not sufficiently affect the peritoneal surface. Perhaps this discreteness constitutes the indication for the lesser operation.

The published work on Crohn's disease shows that, at the time of writing, some 450 cases have been operated on. Some appear to have been treated by simple short circuit, usually with failure to produce permanent cure. In some cases fistulæ have been a well-marked feature. It seems, therefore, that the two cases here described have been relatively early cases which have fortunately come to operation by reason of early obstructive phenomena. Had they not been operated on at this stage, subsequent infection might have led to sinus formation and possibly general peritonitis.

My thanks are due to Dr. Anderson, of Liverpool, for cutting sections and allowing me to use photographs of them.

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PENICILLIN IN CHRONIC OSTEOMYELITIS

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IN the six months from June, 1945, 26 cases of chronic osteomyelitis were treated by local surgery in conjunction with penicillin at Stracathro Hospital.

Of these, 6 were due to a blood-borne infection and 20 to compound fractures caused by battle wounds. The average duration of the former cases was 21 months and the latter 16 months. In 10 cases there had been at least one previous sequestrectomy, and in 13 others the original wound had never healed. In the remaining 3 cases the original wound had healed but subsequently broke down, and sequestrectomy became necessary. The sites of infection were: femur 10, tibia 8, humerus 3, fibula 3, tarsus 1, fifth lumbar vertebra 1.

LOCAL SURGERY

Each patient underwent forty-eight hours' skin preparation before operation and was in every way treated as a clean case. This precaution is necessary to guard against further infection, and the fact that sepsis is already present does not justify any relaxation of aseptic technique. In cases where an extensive procedure appeared necessary, or the patient's general condition was not good, the blood-group was ascertained before operation, and preparations were completed for a transfusion during operation or in the immediate postoperative period.

At operation all infected granulation tissue was excised and dead bone removed. This was done with the minimal disturbance of healthy bone, but in some cases it was necessary to enlarge an already existing bone cavity to gain access to a sequestrum or to ensure proper drainage. In every case an X-ray film was taken in the operating-theatre as a precaution against any sequestra being overlooked. A rubber tube $^1/_8$ in. in diameter and 6–8 in. long was then inserted into the cavity and anchored to the skin with a silkworm-gut suture. The tube had several lateral holes to ensure the dispersal of penicillin to all parts of the cavity. The wound was then sutured with silkworm gut, and a dry gauze dressing was applied. No deep catgut sutures were used, unless absolutely necessary to control hæmorrhage. The affected part was then immobilised in a plaster cast and the wound left untouched until the administration of local penicillin was stopped.

ADMINISTRATION OF PENICILLIN

The penicillin was administered by one of the following four methods, depending on the extent and severity of the case, all cases receiving penicillin locally.

(1) Local only.
(2) Local plus a boost dose intramuscularly at operation.
(3) Local plus general penicillin in the preoperative and postoperative stages.
(4) As in (3), plus a boost dose intramuscularly at operation.

(*a*) Four cases had the penicillin by the local route only. These showed a single well-defined sequestrum and a localised osteomyelitis. It therefore appeared unnecessary to give the drug by the general route.

(*b*) Seven cases had a boost dose of 50,000 units of general penicillin along with the local administration at the time of operation to guard against a flare-up of infection in the immediate postoperative period. These showed a slightly more extensive bone infection than in (*a*).

(*c*) Fifteen cases were given general penicillin, both in the preoperative and postoperative periods, together with the local administration. These cases showed an extensive bone infection, and some had multiple sequestra.

(*d*) Nine of the cases in (*c*), because of the severity of the infection, were given a boost dose of 50,000 units during operation as an additional safeguard.

Local Administration.—The calcium salt of penicillin was dissolved in saline and given either by injection into the tube every three hours or by continuous drip. The latter method was the most satisfactory and required very little supervision. The strength of the penicillin solution varied from 250 to 350 units per c.cm., and 5000–7000 units was given every twenty-four hours. The total amount of local penicillin given depended on the extent and severity of the infection as seen at operation. The average dose was 85,000 units.

General Administration.—The penicillin was given by the intramuscular route with the Eudrip 3 apparatus, 100,000 units being given every twenty-four hours. In the severe cases the penicillin administration began forty-eight hours before operation and continued for forty-eight hours after the pulse and temperature had returned to normal. The intramuscular needle was changed usually after 400,000 units had been given, but in several cases 800,000 units was given over an eight-day period with no reaction at the needle site. Provided strict aseptic precautions were observed in inserting the needle, no serious local complication arose. In only 3 cases was there evidence of local heat, tenderness, and induration, which subsided rapidly after the removal of the needle and the application of local heat. In no case was the three-hourly intramuscular injection technique used. There were no general reactions in any of the patients.

BACTERIOLOGY

All wounds were swabbed before operation, and in 24 cases *Staph. aureus* was found. In most of those cases *Bact. coli*, *B. proteus*, and *Ps. pyocyanea* were also present, either alone or in combination. In the 2 remaining cases hæmolytic streptococci were present in one and *Staph. albus* in the other.

Every second day during the administration of general penicillin a specimen of the patient's plasma was tested to assess its power of inhibiting the growth of staphylococci. In every case the plasma inhibited the growth of a standard (Oxford) culture of the organism in a dilution of 1 : 3 to 1 : 5, which was considered satisfactory.

The wound was inspected after the cessation of local penicillin administration, and a further swab was taken. In 20 of the 24 cases which originally showed the presence of *Staph. aureus* the organism had been completely eliminated. In the remaining 4 cases *Staph. aureus* was still present in discharge from the wound. In 3 of these the staphylococci were found to be penicillin-resistant though sensitive before operation. In the other patient the staphylococci were still penicillin-sensitive, and the organism succumbed rapidly in a few days to the application of penicillin powder. The penicillin had no action whatever against *Bact. coli*, *B. proteus*, or *Ps. pyocyanea*.

The hæmolytic streptococci present in one case before operation were eliminated, and likewise the *Staph. albus* in the other case.

TREATMENT AFTER CESSATION OF LOCAL PENICILLIN

In the 20 cases in which the *Staph. aureus* was eliminated the treatment was directed against the penicillin-resistant *Bact. coli*, *Ps. pyocyanea*, and *B. proteus*. In general, three wound dressings were used: (1) a combination of euflavine and sulphathiazole powder applied to the wound every forty-eight hours; (2) 'U.F.I.' powder (urea formic iodide, Southon Laboratories) dusted on the wound, the plaster reapplied and left untouched for ten days; and (3) alternate daily dressings of U.F.I. powder and eusol. The last dressing was the most efficacious and was particularly useful in eliminating *Ps. pyocyanea*.

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In the 3 cases in which penicillin-resistant staphylococci were present *Bact. coli* and *Ps. pyocyanea* also persisted along with the staphylococci. All 3 withstood a concentrated attack with (1) sulphathiazole powder, (2) a mixture of the latter and euflavine, and (3) alternate dressings of eusol and U.F.I. powder.

The case originally infected by streptococci and the other by *Staph. albus* healed rapidly under treatment with a mixture of euflavine and sulphathiazole powder.

RESULTS

Of the 26 cases, 23 were completely healed in an average period of seven weeks and have remained soundly healed for an average period of four and a half months. The 3 cases in which penicillin-resistant staphylococci were present after the cessation of local penicillin were still unhealed four months, six months, and seven months respectively following operation. These cases all had large doses of penicillin by both local and general routes at the time of sequestrectomy. One of those cases, an extensive infection of the femur, has still a copious discharge and will require a further sequestrectomy. The organisms now present in a recent examination are *Staph. aureus* and *Ps. pyocyanea*, the staphylococcus now being penicillin-sensitive. The second case, which involved the tibia, was transferred to another hospital four months after sequestrectomy; at that time the wound was still unhealed and further sequestration had occurred. The third case, which also involved the tibia, is now almost healed but the discharge still contains *Staph. aureus* (penicillin-sensitive) and *Ps. pyocyanea*.

CONCLUSIONS

1. The results obtained in these cases were a great improvement on those previously gained in this unit without penicillin.

2. The general condition of the patients after operation was much better than in the pre-penicillin days; the ward sisters were particularly impressed by this factor.

3. The only 3 cases that did not heal showed the presence of penicillin-resistant staphylococci after operation, and these cases were still unhealed many weeks afterwards, despite the fact that the staphylococci again became penicillin-sensitive. It appears possible that during the period of resistance to penicillin the organisms cause further bone infection and destruction.

4. It was shown that once the staphylococci were eliminated, the penicillin-resistant group, *Bact. coli*, *Ps. pyocyanea*, and *B. proteus*, succumbed in a few weeks to such preparations as a mixture of euflavine and sulphathiazole powder, U.F.I. powder, and alternate dressings of the U.F.I. powder and eusol.

5. Local surgery, in conjunction with penicillin, offers a definite hope of clearing many cases of chronic bone infection. The local surgery must be adequate, and care must be taken to remove all infected tissue and sequestrated bone; otherwise the local administration of penicillin is valueless.

6. There has been some doubt about the value of penicillin in the treatment of chronic bone sepsis. In this series, however, 23 out of 26 cases healed and have remained healed for an average period of four and a half months; 19 of the patients have returned to work, including several doing hard manual labour. It appears, therefore, that penicillin has an important part to play in the general scheme of treatment of chronic osteomyelitis.

I wish to thank the Department of Health for Scotland for permission to publish this report.

"... Medical men must learn that psychoneuroses and psychoses are mental illnesses not secondary to physical disease, and that no form of rest cure, drug therapy, surgery, or any approach directed to treating an emotional problem at a physical level is scientific."—A. E. BENNETT, *J. Amer. med. Ass.* 1946, **130**, 1203.

CHRONIC DIARRHŒA TREATED WITH FOLIC ACID

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THE chief sources of folic acid have hitherto been milk, spinach, grass juice, liver, and yeast; but Angier et al. (1945) have made a synthetic preparation which is considered to be identical with the crystalline folic acid isolated by Stokstad (1943) from the liver. This synthetic folic acid is reported to be valuable in the treatment of macrocytic anæmias (Moore et al. 1945, Spies 1946), and, through the courtesy of the Lederle Laboratories Inc., we were recently supplied with a small amount of it for clinical trial.

Since patients with macrocytic anæmia are not common in this hospital, 4 severe cases of hypochromic anæmia were selected for treatment with folic acid. The dosage was 40–60 mg. daily, and all other therapy was suspended. In one of these patients the anæmia was secondary to chronic malaria, in another to chronic glomerular nephritis, and in the remaining two to chronic diarrhœa. The red-cell counts ranged from 560,000 to 1,800,000 per c.mm., and the hæmoglobin estimations (Sahli) from less than 10% to 30%, but in no case did treatment with folic acid in the 5–7 day period allowed lead to any noteworthy improvement in the anæmia. However, in the 2 cases with chronic diarrhœa an immediate and definite improvement in the stools took place, and this led us to abandon the use of our limited supply of folic acid for the treatment of anæmia and to try its effects in 6 cases of chronic diarrhœa, which are reported briefly below.

CASE-RECORDS

CASE 1.—A man, aged 25, had had diarrhœa for six months and had been under treatment in hospital for a month without improvement. When folic acid therapy was decided on, his red cells numbered 1,200,000 per c.mm., Hb 20%, and he was passing from six to eight loose watery motions daily. Amœbæ had been found in his stools, and sigmoidoscopy had revealed numerous pin-point ulcerations in the lower sigmoid, but two courses of emetine and carbarsone had not cured him.

All other therapy was discontinued, and 50 mg. of folic acid was given daily for five days. The anæmia remained unchanged, but at the end of the five days the patient was passing only one normally formed stool daily, and stool examination revealed no abnormal findings. Two weeks later, on a maintenance dose of 15 mg. of folic acid daily, the stool was still normal.

CASE 2.—A boy, aged 16, had been six weeks under treatment in hospital for anæmia and chronic diarrhœa without any improvement in either condition. He also had anasarca, ascites, a low serum-protein level, and polyneuritis. At the end of the six weeks these were all still present; red cells numbered 1,800,000 per c.mm., Hb 30%. He was still passing from six to ten watery stools daily, which revealed only the presence of pus cells on examination.

Folic acid 50 mg. was then given daily for five days without other medication. At the end of the five days he was passing one or two normally formed stools daily, but the anæmia had not improved. A month later, on folic acid 15 mg. daily, the stools were normal and his general condition much improved, but the red cells still numbered less than 2,000,000 per c.mm.

CASE 3.—A doctor, aged 32, had been under treatment for diarrhœa for the past year. During this time he passed from four to six watery stools daily, and *Entamœba histolytica*, both vegetative and cystic, had been repeatedly found. Several courses of emetine, carbarsone, large doses of liver extract, yeast, and thiamine chloride had produced only a slight improvement, and he had not had a normal motion once during all this time. Sulphaguanidine and penicillin had also been tried without effect.

Folic acid 50 mg. was given daily for five days, all other therapy being suspended. Four days after starting the folic acid the patient passed his first normally formed stool in over a year and then remained constipated for thirty-six hours. Thereafter he continued to pass one normal stool daily on a maintenance dose of 15 mg. daily. This has continued for a

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month now, except for three days when he omitted the folic acid to see what would happen. Twenty-four hours later he began to have loose stools once more, but these were promptly controlled again with folic acid.

CASE 4.—A boy, aged 16, was admitted in a very emaciated and weakened condition with a history of having had loose and watery motions for the preceding six months. The abdomen had a distinctly doughy feel; and, though radiography of the chest did not show any signs of tuberculosis, and the Old-Tuberculin test, 1/100, was only questionably positive, the impression is still that this is probably a case of intestinal tuberculosis. Stool examinations revealed only pus cells as an abnormality, but the culture was positive for Flexner-Y bacillus. He had been under treatment for five weeks in hospital without any improvement, and he continued to pass from four to six watery stools daily.

All other therapy was stopped, and folic acid 60 mg. was given daily. Five days later he was passing only one normally formed stool daily. Folic acid had to be discontinued after two weeks for lack of supplies; but so long as this drug was continued the stools remained normal.

CASE 5.—An American nurse, aged 35, was admitted to hospital with severe lower-abdominal griping and a history of passing three or four loose stools daily. There was severe mental and physical depression. Her symptoms had begun with an acute attack of dysentery two months previously, only forty-eight hours after she had reached India. Since then she had been confined to bed. No anæmia was present. Stool examinations showed only pus cells, and cultures only normal intestinal bacteria, but radiography of the gastro-intestinal tract suggested an amœbic infection of the cæcum and ascending colon. Emetine, carbarsone, and sulphaguanidine had produced no improvement.

After full courses of these, folic acid 60 mg. daily was added. The response to the folic acid was immediate and three days later her motions were normal, one well-formed stool being passed daily, the griping had ceased, and she felt well enough to be up and about. After another two days the folic acid was reduced to 15 mg. daily, and twenty-four hours later she had three semi-solid stools. Folic acid was again increased to 30 mg. daily, and this at once restored the stools to normal for the ensuing week, when the drug had to be stopped for lack of supplies. The great improvement in the sense of well-being in this patient was dramatic.

CASE 6.—A girl, aged 9 years, was admitted with a history of chills and fever and of passing from three to six loose stools daily for the preceding two months. Her red cells numbered 1,580,000 per c.mm., Hb 26%. The presence of leucocytes was the only abnormality found on stool examination. Chest screening showed normal lung markings, and the Old-Tuberculin test, 1/1000, was negative. She was treated for two weeks with routine therapy directed at the malaria and the diarrhœa, but the bowel condition did not improve.

Folic acid 40 mg. daily was then started and all other therapy stopped. Within forty-eight hours she was passing normal stools, well formed and only once daily, and she was put on a daily maintenance dose of 15 mg. Antimalarial therapy did not bring the fever under control until a week later, but the diarrhœa has not recurred. The anæmia remains unaffected.

COMMENT

In these 6 cases of chronic diarrhœa, folic acid therapy restored the stools to normal or approximately so within 2–5 days. These results are significant but by no means conclusive. The series is small, and lack of adequate supplies of folic acid and of time have prevented more detailed study and follow-up. The absence of any common ætiology suggests that in any long-standing diarrhœa a nutritional factor prolongs the production of abnormal stools. Folic acid appears to correct this defect. It is also probable that the need for the folic acid persists, in view of the reversion to looseness where maintenance doses of the drug were not continued. Spies (1946) reports improvement in the character of the stools in the one case of sprue he treated with folic acid. None of our patients had the characteristic picture of sprue, but the existence of a relationship between sprue and other forms of chronic diarrhœa is suggested by these common results. We have long recognised that crude liver extract and yeast in large doses will produce slight but definite improvement in many cases of chronic diarrhœa.

SUMMARY

Folic acid had no effect on four severe cases of hypochromic anæmia.

Folic acid produced rapid improvement in the character of the stools in 6 cases of chronic diarrhœa of varied ætiology, though it did not affect the anæmia present.

A nutritional deficiency probably explains the persistence of the diarrhœa in these cases.

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ŒDEMA IN RECOVERED PRISONERS-OF-WAR

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FAMINE œdema and war œdema are usually ascribed to chronic protein deficiency. The following account suggests that other factors may be involved.

Among 900 Australians who embarked at Singapore on Sept. 22, 1945, 98 cases of œdema were observed. The past history of 81 of the patients was as follows. They had been taken prisoner in February, 1942, and had either lived on Singapore Island all the time or had been on working parties in Burma and Thailand for various periods. Of these 81 men, 76 had had benign tertian malaria, the number of attacks varying from five to fifty, with an average of fourteen attacks; 20 had had malignant tertian malaria; 14 had been infested with some type of intestinal worm, usually roundworms; 29 had had scrotal dermatitis; 1 had had pellagra (in 1945); 12 had had glossitis at some time during captivity, and on examination 9 showed smoothness and soreness of the tip and edges of the tongue; 2 had had a form of retrobulbar neuritis which the medical officers who had been in captivity with the prisoners attributed to a deficiency of riboflavine; 20 had had the dry form and 48 the œdematous form of beriberi; and 33 had never had beriberi. Of the 68 beriberi cases 67 developed during 1943 and 1944; the exception was a case of wet beriberi which developed in August, 1945. During captivity the diet had consisted mainly of rice, vegetables, and a small quantity of fish.

Treatment.—From Sept. 22, 1945, the day of embarkation, all troops in the ship were given two multi-vitamin tablets daily (each tablet stated to contain vitamin A 5000 I.U., vitamin D 500 I.U., vitamin B_1 1 mg., vitamin B_2 2 mg., vitamin C 30 mg., and nicotinamide 10 mg.). Patients with œdema were given also at least 9 mg. of thiamine hydrochloride daily. They took salt with their meals according to taste.

Clinical picture.—There was œdema of the ankles and often of the face. Frequently this first appeared after the patient had been on a normal diet for a few days or several weeks. Particular interest attaches to those who denied having had any swelling of their ankles while in captivity. One man developed œdema for the first time on Oct. 3, 1945, six weeks after the change from rice to a normal diet. The œdema fluctuated and was postural. It was often noted in the face in the morning and became more severe in the ankles in the evening. However, in some cases the œdema was very pronounced throughout the day, involving the whole of both legs and the face. There was sometimes a sudden diuresis, with temporary diminution in the œdema. Many patients had tender legs and feet after the œdema had subsided. The knee jerks were present in all cases. The urine was normal.

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A comparison of the weights of those with and those without œdema showed no significant difference. The soldier's weight before captivity being taken as his normal, the average loss in weight of those with œdema was 17 lb. and of those without œdema 19 lb. (50 cases). The blood-pressure was taken in 31 cases: in 17 the systolic reading was higher than 140 mm. Hg, and in 7 the diastolic was higher than 90 mm. Hg. The lowest readings found among these 31 men were 130/80 (lowest systolic reading) and 150/75 (lowest diastolic reading), and the highest readings were 160/80 (highest systolic reading) and 150/105 (highest diastolic reading).

The most striking feature was the spontaneous statement by many patients that their œdema only developed after they had been on a normal diet for some days or weeks; some of them associated this with the cessation of compulsory manual labour and therefore of excessive sweating.

The observations on weight, blood-pressure, and fluid intake and output were not quite conclusive. However, the usual sequence of events after putting a patient to bed was for the blood-pressure to fall, the urinary output to rise, and the weight to fall; but after about three days the urinary output often decreased, the fluid intake was higher than before, and the blood-pressure and weight increased again. There appeared to be a definite correlation between weight, fluid balance, and blood-pressure.

ILLUSTRATIVE CASE-RECORDS

CASE 1.—A lance-corporal, aged 29, was taken prisoner at Singapore in February, 1942. He had benign tertian malaria in 1943, followed by 29 relapses, the last being in April, 1945. He had "happy feet"—the name given by the prisoners to the neuritic type of beriberi—in 1942; he never had the œdematous type of beriberi. He was found to be infested with strongyloides in July, 1945, but did not receive any treatment. He reported sick on Sept. 24, two days after embarkation, saying that he had had swelling of his ankles in the evening during the previous two weeks. Until that time he had never had œdema. His weight before captivity was 168 lb.

On examination he weighed 136 lb.; he had interdigital tinea of his feet and slight œdema of the ankles; he was given 9 mg. of thiamine hydrochloride by mouth each day. He was seen again on the 26th, when the œdema was more severe and his weight had risen to 142 lb.; blood-pressure 140/80 mm. Hg. He was then admitted to hospital. He had much diuresis during the succeeding twenty-four hours, passing 98 oz. of urine, and drinking only 58 oz. of water or tea. His weight, at 141 lb., showed no significant change during the next three days, but his blood-pressure fell to 110/75. He was discharged from hospital on the 29th with no apparent œdema. By Oct. 1 his weight had risen to 146 lb. and his blood-pressure to 130/80, his œdema having returned. On the 5th his weight was 150 lb. and his blood-pressure 140/80.

Date	*Fluid intake (oz.)*	*Urinary output (oz.)*	*Weight (lb.)*	*Blood-pressure (mm. Hg)*
Sept. 26	58	98	142	140/80
„ 27	88	77	141	120/75
„ 28	61	74	141	120/75
„ 29	..	..	141	110/75
Oct. 1	..	..	146	130/80
„ 5	..	..	150	140/80

This was a typical case, in which there was a good response to rest in bed, with a return of œdema a few days after leaving hospital.

CASE 2.—A private reported sick, on Sept. 25, with diarrhœa; he had been having four or five loose motions a day for eight weeks. His diarrhœa was not affected by sulphaguanidine or by kaolin powder. When first seen his weight was 126 lb., and he had no œdema of the legs. On Oct. 3 he developed pitting œdema of the legs for the first time. His weight had risen to 133 lb.; blood-pressure 140/80 mm. Hg.

CASE 3.—A private, aged 29 years, reported sick on Sept. 27. He had had diarrhœa for six weeks in 1942, amœbic dysentery in March, 1943, and scrotal dermatitis in September, 1944. In July, 1945, he had developed œdema of his ankles, and he had had it off and on ever since; it had subsided about a week earlier but had recurred. His normal weight was 168 lb. On examination he weighed 133 lb. He had moderate œdema of his ankles. Blood-pressure 135/90 mm. Hg. Red-cell count 3,390,000 per c.mm.

He was admitted to the ship's hospital, and the œdema subsided. His skin was very tender over the areas which had been œdematous. After his discharge on Oct. 1 his weight rose and his œdema returned; on the 6th his weight was 140 lb. and blood-pressure 150/85 mm. Hg.

Date	*Fluid intake (oz.)*	*Urinary output (oz.)*	*Weight (lb.)*	*Blood-pressure (mm. Hg)*
Sept. 27	77	67	133	135/90
„ 28	111	83	129	130/85
„ 29	118	50	128	130/75
„ 30	140	51	130	..
Oct. 1	..	..	131	125/75
„ 3	..	..	140	150/90
„ 6	..	..	140	150/85

DISCUSSION

The evidence, although incomplete, suggests that the œdema was the result of malnutrition. Lack of vitamin B_1 may have been a contributory factor, in view of the deficient diet and the forced labour which would increase the metabolic requirements. It seems unlikely, however, that B_1 deficiency was a major factor, because of the absence of recent beriberi in the prisoners before release, and because the œdema developed during supplementary vitamin-B therapy.

The association of transient hypertension with the œdema is unusual and interesting, particularly in the absence of albuminuria. If it is conceded that the œdema was most likely dietary in origin, the possibility arises that the hypertension had a similar dietary origin.

The appearance of the œdema after a return to normal diet is also of interest and has been observed by others (W. L. Neal, unpublished). Several of the patients noted that the œdema first appeared soon after they stopped having to work, and thought it might be related to the fact that they then stopped sweating. This increased opportunity to conserve salt previously lost in the sweat may have been a factor leading to the appearance of a nutritional œdema previously rendered latent by salt deficiency.

SUMMARY

Among 900 recovered prisoners-of-war from Singapore 98 cases of œdema were observed.

The œdema appeared after the prisoners' release and return to normal diet. It was sometimes associated with transient hypertension, but not with albuminuria.

"... I like to think of medical art as a plant rooted in science, which, if cultivated with skill and dexterity, will flower as intuition, insight, and understanding."—CARLTON C. CURTISS. *Med. Rec.* 1946, **159**, 235.

"... It is not enough to say that the classics teach accuracy; the same can be said of mathematics. Nor that they inculcate taste; the same can be said of French. Nor that they open avenues to important fields of speculation; the same can be said of history. Nor that they are indispensable to the correct use of English; the same can surely be said of English itself, and I have not found that classical scholars are inevitably masters of their own tongue. ... The real and special claim of a classical education is something different. ... The study of the ancient languages is a training not only in words but in thought. The Greeks and the Romans presented their ideas in a way quite unlike ours. ... To understand them we have to make an effort which we do not have to make in our own or in any other contemporary European language, and in making this effort we widen our understanding and make our intellects more supple. ... It is this intellectual exercise, this adaptation of our minds to something alien and unfamiliar, that the classics have to give us."—C. M. BOWRA. *A Classical Education.* Presidential address to the Classical Association at Oxford. London. 1945.

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Medical Societies

NUTRITION SOCIETY

THE English group of the society met on May 18 at the London School of Hygiene under the chairmanship of Dr. P. S. SELWYN-CLARKE, director of medical services and chairman of the Nutrition Research Committee, Hong-Kong, to discuss

Nutritional Experiences in Prisoner-of-War and Internment Camps in the Far East

Lieut.-Colonel J. BENNET, R.A.M.C., described conditions in Army prison camps in Formosa representative of the northern group of Far Eastern camps. The diet was such that in the absence of conditioning factors a reasonable state of health might have been maintained. Rice was issued either unpolished, or, if polished, reinforced with a varying admixture of barley, millet, and soya beans. Fresh vegetables were given in reasonable quantity, but were often of coarse texture. The main conditioning factors arose from the harsh standards of fitness for work enforced by the Japanese and from the prevalence of diarrhœa. Features of deficiency diseases were rarely seen in groups of men who were rested; they did not occur, for example, in a number of cases of pulmonary tuberculosis. In working camps nutritional œdema overshadowed and complicated almost every other condition. In some camps the œdema was classified as beriberi, but this diagnosis disregarded its soft pitting character and distribution determined by posture. Diarrhœa, which undermined health to a great extent, seemed to be due rather to mechanical irritation of the alimentary tract from excess cellulose than to a nutritional deficiency. In severe and persistent cases of œdema the diarrhœa was often intermittent, occurring as explosive evacuations in the early morning, and such outbursts were followed by some temporary remission of the œdema. Mild glossitis was seen in the persistent cases. Neuritis, possibly due to vitamin-B_1 deficiency, appeared in later years, but it bore features very different from those seen as an integral part of the picture of beriberi. There was much spontaneous pain in the bones and joints and cramping sensations in the feet; symptoms of "burning feet" contracted in the southern areas, tended, however, to disappear. The complete picture of the sprue syndrome was a rarity. The skin tended to be dry and to scale easily on exposed parts. Patients who returned to work after treatment indoors often developed a dark brown pigmentation of the scrotum, margins of the axillæ, and groins, but the scrotal dermatitis and angular stomatitis with which many prisoners left Singapore almost disappeared in Formosa; cases of retrobulbar neuropathy were fewer and milder than in the south and only one case of severe microcytic anæmia was encountered. Blood blisters in the mouth were often seen even in the apparently fit.

HONG-KONG: DIETARY CONDITIONS IN THE CIVILIAN INTERNMENT CAMP

Dr. D. A. SMITH, medical officer, Colonial Medical Service, Hong-Kong, spoke about conditions in the civilian internment camp in Hong-Kong between January, 1942, and August, 1945. The camp contained some 1300 men and 900 women of all ages up to the eighties and 300 children under sixteen. The staple diet was highly milled rice of poor quality, with small issues of meat (later mostly replaced by salt dried fish), oil, and salt. The remainder of the ration was made up of vegetables, mostly coarse. Calculation from tables showed that the food supplied some 1600 calories and that it was deficient in most factors with the exception of carotenoids, vitamin C, and iron. On rare occasions Red Cross supplies reached the camp and in the last two years produce of camp gardens became available. Loss of weight was rapid in the first six months but later equilibrium was established at a lower metabolic level. The least changes were in the age-group 25–34 years, the greatest in the over-65's. With this fall in weight were associated hypotension, bradycardia, and subjective symptoms of weakness. Amenorrhœa was present in 58% of women. The first specific vitamin deficiency noticed was subacute wet beriberi, of which the first case was seen 87 days after the Japanese occupation. The incidence rose rapidly and the disease followed acute bacillary dysentery in 55% of dysentery cases. It yielded readily to intramuscular injection of 5–10 mg. of vitamin B_1 daily, the cure taking two or three weeks. A prophylactic dose of 3 mg. by mouth every other day kept new cases in check while the supply of vitamin B_1 lasted. In 1943 the disease reappeared and it was observed whenever the ratio of international units of vitamin B_1 to non-fat calories in the diet fell below 0·25 : 1. The incidence was higher in spring and summer than during the cold season. Cases of chronic dry beriberi were uncommon—6 against 844 of the wet type. Over 300 cases of œdema without neurological manifestations, of which 120 were rapidly cured by a daily addition of 4 oz. of bully beef, accompanied the first outbreak of wet beriberi. In July, 1942, appeared the first of over 700 cases of "electric feet" or "burning feet." In spite of intolerable sensations of burning or freezing no actual change was observed in skin temperature or in vascular or vasomotor conditions. The response of this sensory neuropathy to vitamin B_1 was disappointing, but there was slow but steady improvement when beans, wheat bran, and rice polishings could be added to the diet. Pellagrous manifestations were numerous, with nearly 600 cases, the common lesions being fiery red glossitis and buccal ulceration. Symptoms usually ascribed to riboflavine deficiency, characterised by cheilosis, angular stomatitis, large pale indented tongue, maceration of the buccal mucosa, and genital dermatitis, followed a few months later and in the vast majority of cases were coexistent with the nicotinic-acid deficiency; the dermatitis responded dramatically to nicotinic acid but the effect on the mouth lesions was slower. The connexion between riboflavine intake and the orogenital symptoms ascribed to ariboflavinosis was not so apparent, though yeast grown in camps proved beneficial. There were 55 cases of tropical macrocytic anæmia, 10 among pregnant women, with a case-mortality of over 20%, but in women recovery followed delivery or termination of pregnancy. The first of 370 cases of amblyopia or nutritional retrobulbar neuropathy was noted in 1942. No correlation between outbreaks of this disease and changes in the diet could be detected and every possible treatment was tried without success.

SINGAPORE: EXPERIENCES IN THE CIVILIAN AND IN THE MILITARY CAMPS

Dr. R. G. SCOTT MACGREGOR, professor of physiology, College of Medicine, Singapore, described experiences in the civilian camp at Singapore, at first in the Changi convict prison and, from May, 1944, in the Sime Road internment camp. A medical reference committee advised on matters of nutrition and diet. The food consisted of rations issued by the Japanese, mainly rice and coarse vegetables, some Red Cross supplies, and the steadily increasing produce of camp gardens. Throughout the internment the vitamin content of the diet was a serious problem. Stores of rice polishings, ground-nuts, and green dhall were kept and were distributed at times when the Japanese were issuing highly polished rice. These additions, and later the garden vegetables, contributed to the protein content of the diet. The energy value was maintained during the greater part of the first two years at about 2000 calories but this became difficult in 1945. Signs of dietary deficiency were present in some form at all periods. Beriberi appeared after three months' internment but was kept in check later by improvements in the diet. Outbreaks of pellagra occurred in 1944 and 1945; nutritional retrobulbar neuropathy reached its maximum in 1943. Œdema in the form of swollen ankles was frequent. In some cases it was clearly associated with an intake of salt in excess of the physiological requirement. Observations were made at intervals on a group of 150 male internees of different ages and physique. The average weight of this group was in March, 1943, nearly 2 stone below their average weight before internment; it declined further, especially towards the end, in line with the worsening calorie intake. A loss of height of $\frac{1}{2}$–1 inch was found in many cases, presumably due to loss of muscular tone together with absorption from ligaments, joints, intervertebral disks, and heel pads. The systolic blood-pressure was on the average lower than would be expected. Reputed cases of

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high pressure gave values close to the average, though established pathological hyperpiesis did not fall and some sufferers died during internment. Mean hæmoglobin values of 80 % (Tallquist) were observed in 1942–44, but during the last year values above this figure or counts above 4,000,000 per c.mm. were extremely rare among the internees.

Dr. R. C. BURGESS and Dr. E. K. CRUICKSHANK spoke of conditions in the military camp at Singapore. The Japanese rations and all supplements it was possible to purchase supplied about 2500 calories daily, though in the last year the figure fell to 2000 calories. Since most of the prisoners had to work, there was a loss of weight of 14 lb. in a representative group in the first three years and a further 15 lb. in the last six months. The diet was imbalanced in respect of the components of the vitamin-B complex, but neither an estimation of the food value nor clinical evidence suggested any other deficiencies. Beriberi was the first deficiency to appear, within a month or six weeks. The daily diet at the time contained approximately 0·4 mg. of vitamin B_1; thereafter the disease fluctuated with changes in diet and the incidence could be forecast from the composition of the food. Yeast grown in the camp proved of little value as a prophylactic. Changes in the mouth, aching feet, and scrotal dermatitis showed similar trends in incidence and bore some relationship to the level of riboflavine but not of nicotinic acid in the diet, while pellagroid skin rash showed the opposite tendency. Green leafy vegetables protected against these diseases when the daily supply was in the region of 180 g. Clinical features of the beriberi seen in the camp were hypertension in the cases with gross œdema, and acute left ventricular failure when heart-failure occurred. The syndrome of painful feet was distressing, the patients becoming worn out from pain and loss of sleep. Of the 500 cases seen, 30 % had scrotitis, 27 % angular stomatitis, and 13 % retrobulbar neuropathy. Grossly exaggerated knee and ankle jerks were seen in 23 %, and hypertension in 51 of 189 cases where blood-pressure was taken. Some 40–50 cases were seen of a spastic syndrome characterised by weakness in one or both legs apparently from a pure upper motor neurone lesion. Additions to the diet of vitamins and protective foods produced slow gradual improvement, incomplete in the more severe cases.

NUTRITIONAL CONDITIONS AMONG WOMEN AND CHILDREN

In the last paper Dr. CICELY WILLIAMS, lecturer in pædiatrics, Medical College, Singapore, dealt with nutritional conditions among women and children interned in Singapore. In March, 1942, the camp contained 400 women and children; by August, 1945, the number had increased to 1000 women and 300 children. During the whole period there were 20 births and some 30 deaths. On the whole, the women stood the exigencies of the diet better than the men in Changi prison and later Sime Road camp. The hospital accommodation for women was also better, and hospital diets always contained some extras. Towards the end of internment loss of weight was nevertheless universal. Giddiness was troublesome, especially among the older women. A puzzling but very constant phenomenon was nocturnal diuresis. In the majority of women who were previously menstruating normally menstruation either ceased altogether or became scanty or irregular. In some cases one or two high-protein meals were enough to initiate menstruation. Mild anæmia was seen in almost all inmates. Specific vitamin deficiencies were not common. Mild neurotic forms of beriberi were seen, and slight œdema appeared in most women at various times. Skin manifestations of pellagra appeared when more time was spent out of doors, and were controlled by keeping out of the sun. Ulcers and boils were much less prevalent among women and children than among men. On the whole the children did well. The only deaths were those of 2 babies shortly after arrival at camp from diseases contracted outside. A few cases of mild diphtheria appeared from time to time and there were two outbreaks of whooping-cough. The children were small and light for their age, but they were not unenterprising or apathetic. Mothers during pregnancy and lactation were given all the extra diet that could be secured. Breast-feeding was achieved in every case.

ROYAL SOCIETY OF MEDICINE

AT a meeting of the new section of endocrinology on May 22, with Mr. L. R. BROSTER in the chair, the inaugural address on the

Birth of Modern Endocrinology

was read for Sir WALTER LANGDON-BROWN, the president, by Dr. RAYMOND GREENE. The development of endocrinology was traced in the address from 1891, when a committee was appointed to investigate the cause of myxœdema. Its association with thyroid failure was recognised, but the tendency was to regard the disease as due to a failure of excretion, which the bloated aspect of the myxœdematous patient might well suggest. G. R. Murray claimed that the condition arose not from failure of excretion but from loss of an active internal secretion. To emphasise his faith in this hypothesis he showed a case of myxœdema at a meeting of the Newcastle and Northumberland Medical Society, and announced that he proposed to treat it with an extract of thyroid gland. A senior member of the society was heard to say that it would be just as sensible to treat a case of locomotor ataxy with an emulsion of spinal cord. Undeterred, Murray arranged to dissect out sheeps' thyroids in a slaughterhouse with antiseptic precautions; and a year later he again showed the same case, which had been cured by his extracts. When Hector Mackenzie in the following year showed that the extract could be taken by mouth in tablet form, thyroid therapy leapt ahead; but its early triumphs caused later disappointment because it was too hastily assumed that other gland extracts were potent by the same route.

The next phase was the discovery of an active adrenal extract. Tissue extracts had all been found to lower blood-pressure; but G. Oliver, a physician practising in Harrogate, declared to Schafer that he had prepared an extract from the adrenals which raised the pressure. Oliver was invited to come to University College, where he convinced Schafer of the accuracy of his observation. This roused fresh interest in Addison's disease, which was regarded as a failure of the adrenals, anatomically so close to the kidneys, to detoxicate the body, until Humphry Rolleston in 1895 adduced evidence of its being an "atony" due to the loss of some internal secretion. The isolation of adrenaline soon followed, but the real cause of Addison's disease was not appreciated until the work of Stewart and Rogoff was published.

Schafer and Oliver's discovery of an active pituitary extract gave the final blow to the excretory theory of endocrine glands, bringing down with it many then-fashionable theories of auto-intoxication. Bayliss and Starling's discovery of secretin in 1902 was full of theoretical interest but has proved disappointing therapeutically. Starling was inclined to regard the initial step in digestion as nervous in origin, starting a succession of chemical reactions. In his Croonian lectures for 1905 he brought forward his "hormone" theory. The name, suggested by W. B. Hardy, means a stimulant of chemical origin to act on other structures at a distance. Before long the theory of independent autonomous glands was replaced by the idea of an integrated endocrine system. "I ventured to call the pituitary gland 'the leader of the endocrine orchestra,' though later it transpired that the hypothalamus holds the still more important rank of conductor of that orchestra." The search for separate pituitary hormones was too amply rewarded, for at least eleven were described. The conception of multiple secretions gave way in time to the idea that the secretions are modified through the hypothalamus in accordance with the needs of the body.

Meanwhile, the clinician was receiving valuable aid from the organic chemist, as was evident in E. C. Dodds's Goulstonian lectures for 1934. Here he showed the importance of a basal group which could be modified to form different hormones, and the close relationship between such substances and the stimulators of irregular growth—i.e., the carcinogenetic substances.

The President then broadly reviewed the general biology of the endocrine system. The enormous energy developed in the zygote provides the impetus which carries the organism on its passage through life. At that moment growth is at its maximum, and, measured in fractions from that original impetus, there is a steady

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decline in the rate of growth. It is the function of life, as Hopkins shrewdly pointed out, to hold up that dissipating energy at a useful level. For the last twenty years or more, interest has concentrated on the quality rather than on the quantity of growth. At an early stage the graft of embryonic tissue from the dorsal lip of the blastopore is capable of imposing its inherent potentialities on its new environment; in this way a neural canal is formed on any part of the embryo receiving the implant. Yet at a slightly later stage the implant has to accept the structural development of its host. Clearly specialisation of organising material has already begun. Joseph Needham found that the organiser was a sterol, reminding us of the chemical structure of certain hormones.

Hormones appeared before the glands that were to house them; and comparative morphology suggests that many of the glands had a more primitive function than that which they now possess. J. F. Gaskell showed that in the lamprey there was a wide distribution of adrenaline-secreting cells, though as development increased these became almost entirely confined to the medulla of the adrenal.

The close association of nervous and endocrine systems, once achieved, has never been dropped, showing that it must be of great advantage to the organism. Pathology illustrates this by the observation that in anencephalic monsters the fusion between cortical and medullary portions of the adrenal does not occur. Loewi and Dale have proved by the recognition of cholinergic and adrenergic nerve-endings that every nervous stimulus is mediated through a chemical mechanism before affecting the tissue cell.

The chemical similarity between hormones as regulators of normal metabolism and carcinogens as stimulators of abnormal growth has excited some apprehension. Amphibian eggs subjected to "delayed fertilisation" illustrate this relationship. If the delay is short, serious imbalance of the sex-ratio ensues; if the delay is longer, multiple liberation or formation of the organiser takes place, and multiple monsters result; if the delay is very long, shapeless teratomata develop, which, if implanted into an adult frog, will give rise to malignant growth, including even metastases. This gradual transition from the normal to the frankly malignant must surely depend on environmental factors. It is, indeed, in connexion with the sex hormones that the overlap between the stimulus for cancer production and the stimuli for the sexual cycle is the most obvious. But this overlap is also seen between the œstrogens and the primary organiser. There is strong support for the opinion that the primary organiser is a sterol-like substance. In view of the exceedingly wide distribution of the primary organiser and the presence of œstrogens in coal-tar, it is significant that œstrogens have been found in some plant tissues. This reminds us of those other exogenous hormones, the vitamins; and the sterol-like character of vitamin D provides another example of overlap between the various growth factors.

Reviews of Books

Leprosy

(3rd ed.) Sir LEONARD ROGERS, K.C.S.I., M.D., F.R.C.P.; ERNEST MUIR, C.I.E., M.D. Bristol: John Wright. Pp. 280. 25*s*.

THE third edition of this useful work records the progress made in spite of the hindrances of war. The section on the distribution of leprosy has been brought up to date, figures up to 1943 being included. Transmission and causation are discussed in the light of recent knowledge. Vaccination against smallpox may cause lepra reactions, and in people previously unsuspected of leprosy these have given rise to the mistaken idea that the disease may be spread by vaccination. Authenticated instances of infection have been reported, however, following arm-to-arm vaccination from a leper.

Work on the lepromin test shows it to be of a different nature to the tuberculin test, and of little value in the diagnosis of leprosy, but it serves to distinguish the lepromatous from the neural cases, the former giving negative and the latter positive results. The relationship of the two main types of the disease is reviewed in the light of increased knowledge. The newer drugs now being used are mentioned, including 'Diasone,' 'Promin,' penicillin, and 'Asiaticoside.'

Thinner paper is used than in the former edition, and though a bibliography has been added and the number of pages increased by 20 the volume is smaller. The good plates and diagrams have been supplemented by 8 new illustrations.

Clinical Neurology

BERNARD J. ALPERS, M.D., SC.D., professor of neurology, Jefferson Medical College, Philadelphia. Philadelphia: F. A. Davis. Pp. 797. $8.

Professor Alpers states his intention of presenting neurology in such a manner as to make it intelligible to medical students and general practitioners, and he has chosen to do so by giving "a concise or detailed account of all the neurological conditions to be encountered in practice." Neurology above all other subjects must be based upon a sound knowledge of anatomy and still more of physiology, for without a thorough acquaintance with general principles the student or general practitioner cannot begin to recognise the disorders he encounters. Dr. Alpers fails to lay this necessary foundation. Nor can he be said to show due proportion in allotting space to different topics. For example, he devotes two pages to fractures and dislocations of the atlas and only four to migraine; psittacosis and gout are listed as "some of the more common conditions" causing headache; and space is found for aspergillus infection of the meninges, which is said to be a "not uncommon" infection of the orbit. Some statements, moreover, are misleading: the pupil described by Argyll Robertson is small and reacts to accommodation but not to light, but Dr. Alpers describes the Argyll Robertson pupil as one which is typically small, but may be dilated, and responds to accommodation but the response may be so slight that it is difficult to see, or even absent. The illustrations and format are worthy of a better book.

Year Book of General Surgery 1945

Editor: EVARTS A. GRAHAM, M.D., professor of surgery, Washington University. Chicago: Year Book Publishers. London: H. K. Lewis. Pp. 736. 18*s*.

THIS yearbook is well known in this country and the 1945 edition is as usual a mine of information. It summarises recent surgical papers of importance, with all too few comments by the editor. The British literature receives a fair share of attention, though the book is mainly based on American experience. From the standpoint of British readers it is a pity that orthopædics and urology should be treated in separate volumes, for specialisation has not reached such a degree here as in America and the general surgeon often faces problems in both these specialties. Since the information in this book is new much of it is necessarily unproven or controversial; but from such a wealth of stimulating matter any surgeon will find something to learn and plenty to think about.

An Introduction to Medical Science

(3rd ed.) WILLIAM BOYD, M.D., F.R.C.P., professor of pathology and bacteriology in the University of Toronto. London: Henry Kimpton. Pp. 366. 18*s*.

AN introduction should enable the novice to see what's what. Professor Boyd keeps this in mind together with the special needs of the nursing profession, for whom his book is intended. In his friendly style, and by the use of simile and allusion, he explains the prime facts of medical science, and except when he discusses the treatment of pneumonia does it without using jargon. After setting out general principles in disease processes, he describes the chief diseases of the various organs, and finally the principles of prevention, treatment, and laboratory investigation. The vast subject has been condensed with judgment, though there is occasional repetition and British readers may wonder why tularæmia has a paragraph to itself. The chapter on the principles of treatment is new to this edition. It is a pity that the quality of the text is not maintained in the illustrations, for though many are good, fully a fifth are in some way unsatisfactory.

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THE LANCET

LONDON: SATURDAY, JUNE 8, 1946

Interim

To many of us one of the chief reasons for favouring immediate establishment of a National Health Service has been that it would go far to solve the problem of doctors returning from the Forces. No Government preparing to provide a comprehensive medical service could ignore the need for conserving medical manpower and especially for building up a bigger body of efficient specialists. Thus committed, we have argued, the Government was bound to regard each demobilised medical officer as an asset and must do its best to see that his talents and experience were utilised and developed. It was equally obvious that without a planned medical service a large proportion of war-time specialists, whom the country needs as specialists, would be forced into general practice because they could gain a livelihood in no other way, while a large proportion of the new general practitioners would start their peace-time careers bearing a burden of debt. By speedy rationalisation of medical services these things, we knew, could be avoided; and now that legislation has been undertaken the outlook has improved. But delays have been too long, and it may yet be two years before the new organisation is in being and able to offer permanent work to the thousands of young doctors who are at present without it. The temporary arrangements made by the Ministry of Health for supporting and training them at hospitals are invaluable; but they are not sufficient to bridge so wide a gap. Further action is required to relieve hardship, to prevent the waste of resources, and to see that the medical work of the nation is carried on as well as possible in the interim.

A great many of the young men and women who have been specialists in the Services are now working as registrars at the larger hospitals, holding appointments renewable every six months. Though their occupation is usually pleasant and professionally profitable, there are nevertheless grave objections to the continuance of this state of affairs, unchanged, for anything approaching two years. In the first place those with family responsibilities are not finding it easy to discharge them on salaries and grants which generally amount to considerably less than they received during the war; secondly, in some hospitals at least, the registrar class is now so numerous that its members are learning less than they would in a "real" job of their own; and thirdly, their aid is needed elsewhere. Some of the hardship, much of the congestion, and not a little of the strain on specialist services would be relieved if the more senior and experienced of these ex-officers were now to be taken on to the regular staff of hospitals. To those of them, however, who were not in practice as specialists before the war it is useless to offer honorary appointments after the old fashion; and in present circumstances they cannot be expected to find a living in that combination of public and private practice which will doubtless be common in the new service. Therefore the hospitals seeking to employ them must offer salaries. Naturally enough, this is just what a great many hospitals have so far been unwilling to do: pending transfer to the regional boards they are disinclined either for experiment or expenditure; and they may not even know what their future status and function is to be. It is true that the Ministry of Health in encouraging some of them to appoint paid specialists has spoken reassuringly about financial support if they get into difficulties; but, with the hospitals generally in the doldrums, indefinite reassurance is not enough. What is clearly wanted is an undertaking by the Ministry of Health to pay the salaries of suitable specialists appointed to hospitals in anticipation of the heavy demands to be expected in two years' time.

What about the man who wants to be a general practitioner? The Spens Committee, though its report may not be fully accepted, has given him a general idea of his financial prospects; but what is he to do before 1948? Unless he is to spend the whole time in junior hospital appointments his main choice is between buying a practice and becoming assistant to an established practitioner. The Government's announcement about the terms of compensation for practices passing into the National Health Service makes it possible, no doubt, to buy a practice without fear of serious loss; but many young men will hesitate to raise a large loan in order to obtain about two years' income. Though the purchaser of a practice, by becoming a principal, secures his right to work henceforward in the place he has chosen, the more convenient course for most new entrants would be to act as assistants till the public service opens to them in 1948. Here, again, however, there are obstacles. Established practitioners are showing a certain reluctance to engage assistants, while many would-be assistants find the remuneration too small for their needs. The man who has acquired a wife and children during the war has been earning perhaps £700–£900 a year with generous tax allowances and free personal keep. If he had remained a civilian he would probably be earning as much now; or if he had been demobilised in less unsettled times he would have had less difficulty in obtaining a similar income—which may be little above the minimum on which he can meet his commitments. The £400–£600 a year yielded by an assistantship must often be insufficient for the man who left his teaching hospital five or six years ago, or more; and timely help would be given to many who look forward to working in the National Health Service if the Ministry of Health would itself engage them for the interim period at a salary in which family responsibilities were taken into account as was done in the Forces. Doctors in such a pool would presumably undertake to work where they were most needed, and part of their cost to the Government would be redeemed by their employment as assistants to practitioners, as assistant medical officers in hospitals, and in filling death vacancies in practices whose interest may revert to the Minister.

We do not yet know the date in 1948 when the new service will come into operation: hopes for January have faded, and there may still be two long years to wait. Meanwhile it is to everybody's interest that every demobilised doctor should be fully employed in work that will give full scope to his potentialities, and that he should be properly paid for that work. The Minister's recent pronouncements, including his

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reply to the deputation described on p. 874, suggest that he is alive to the difficulties in which many of the profession now find themselves. It would indeed be surprising if he were anything but sympathetic in considering a problem so intimately related to the prosperity of the plan he has placed before Parliament.

Artificial Sunlight in Industry

DURING the war those charged with the care of such key personnel as submarine and air crews thought it worth while to use ultraviolet irradiation as an aid to operational fitness. At that time there was little option but to assume that this treatment did good. At least it had some moral effect, in that the men felt that something positive was being done to promote their health and efficiency. A controlled experiment under Service conditions was impracticable, because in those critical days it would have been unfair and unwise to deny any man the possible benefits of treatment which certainly did no harm. Now, however, the Industrial Health Research Board has completed a convincing trial of artificial sunlight as a prophylactic against illness among clerical and industrial workers. The report[1] by Dr. DORA COLEBROOK, the board's investigator, gives a clear-cut answer to the specific question and is also an excellent prototype of the experiments which will become of increasing value in research in social and industrial medicine.

Outside the well-defined field of treatment of such diseases as rickets and non-pulmonary tuberculosis, the precise value of ultraviolet light as a "tonic" or prophylactic against minor sickness has been the subject of much debate. Views and reports were conflicting, and the experimental methods of the protagonists were open to serious statistical criticism. The subject had engendered a good deal of emotional heat among people interested in industrial welfare, and the existence of personal bias on both sides emphasised the need for a watertight experimental design. As in all experiments of this type, the first considerations are the variables involved and their control. Dr. COLEBROOK clearly thought that three factors were of prime importance—the physical action of the ultraviolet rays themselves; the psychological effects of basking in the rays in the soothing atmosphere of a sun-ray clinic; and last, but by no means least, the possible effects of chance influences unconnected with irradiation. To control these factors she divided her volunteers into three groups. The first group were regularly exposed to the unscreened lamps (without causing more than a mild erythema). The second group were exposed to the rays of similar lamps which were screened by ordinary glass to exclude the shorter rays; this group thought they were receiving exactly the same treatment as group 1, so the psychological effects of the lamps were identical in the two groups. The third group, chosen by strictly random selection so as to be as far as practicable like the other two, received no treatment at all. The scope of the experiment was widened by including in the second group a subgroup who received a vitamin-D supplement, and by extending the survey to three types of worker—in office, factory, and mine. As her criteria of benefit from the treatment Dr. COLEBROOK adopted sick-absence, the subjective impressions of the volunteers themselves, and, in the mines, absence either casual or due to injury. All three groups in each of the fields of study were followed up during the course of treatment and for the two subsequent months. Parallel records were carefully kept and then analysed statistically.

The results were substantially the same in the office, factory, and mining groups. In neither the office nor the factory group was there any significant difference in the average amount of sick-absence among those receiving screened and those receiving unscreened rays—that is, there was no evidence that the shorter rays of the spectrum increase resistance to infection. Further, there was no real difference between the sick-absence in these treated groups and in the group receiving no light treatment at all, so the psychological stimulus of the sun-ray clinic also does not increase resistance. Within the screened group, too, there was no sign that the vitamin supplement in any way affected the subject's liability to ailments. In the colliery, the untreated group had a slightly lower sickness-rate than the treated, but this was probably due to the difficulty of obtaining a satisfactory control group by strict random sampling from the volunteers; the treated and control groups were therefore not strictly comparable. Next Dr. COLEBROOK analysed the reported duration of common colds in the clerical and factory workers—it was not possible to collect such data among the miners. Again no material difference was observed between the groups fully exposed to the shorter rays and those exposed to the screened lamps. Among the untreated workers colds lasted a shorter time than in the other groups. Here again, however, there was a suggestion that the more efficient recording of sickness among the people actually attending the clinic might have influenced this result. In the colliery it was possible to compare the absence due to sickness and to other causes in all three groups, and this comparison again gave barely appreciable differences. Lastly, the less precisely measurable impressions of the workers themselves were elicited by interview, and the proportion of subjects who "felt better" was no higher after a full course of sun-ray therapy than in either the "screened" or untreated groups.

To those who hoped that artificial sunlight would prove a useful weapon in the campaign against industrial ill health these results will seem depressing. It is true that some details in the practical conduct of the research are open to criticism—as much is admitted in the report—but from a practical point of view these inevitable imperfections do not detract from the unequivocal nature of the findings. In brief, these findings are that artificial sunlight, used in this particular way in this particular population, has no appreciable effect on health as judged by the criteria adopted in this study. They in no way imply that ultraviolet-ray therapy is useless in other conditions, or when more intensive methods are used. Nor does the finding that this form of "tonic" for industrial workers is of problematical value imply that nothing can be done to raise their resistance to infection and so reduce their sick-absence.

There is an urgent need for research conceived and carried out like this example, and like it freed from any commercial bias, into problems even more fundamental to industrial health than the use of artificial sunlight.

1. Artificial Sunlight Treatment in Industry. *Rep. indust. Hlth Res. Bd, Lond.* no. 89. H.M. Stationery Office. Pp. 64. 1s.

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Infirm and Old

"THE problem of the chronic sick is mainly a problem of the elderly," wrote Sir ARCHIBALD GRAY and Dr. ANDREW TOPPING in their hospital survey of London[1]: to which Lord AMULREE and Dr. E. L. STURDEE[2] add the rider "but most people do not realise that there is a problem." In any case it remains unsolved. To quote from the Yorkshire surveyors[3]:

> "Almost without exception, the accommodation for the chronic sick is made in public assistance hospitals. Some of these have been appropriated and are now public health hospitals, but the majority are still public assistance institutions. In most instances, the wards do not provide either the physical or mental amenities to be found in even the most ordinary well conducted domestic dwelling."

Dr. MARJORY WARREN, whose paper appears in this issue, has previously described[4] the conditions she observed in a public-assistance infirmary before 1935:

> "In the same ward were to be found senile dements, restless and noisy patients who required cot beds, incontinent patients, senile bedridden patients, elderly sick patients who were treatable, patients up and about all day, and unmarried mothers and infants."

This mingling of different types of patients still goes on in many institutions, and it is clear that the most immediate reform needed is proper classification of patients, and especially the segregation of senile dements, as carried out in London. Of no less importance is a rise in standards of diagnosis and treatment. In her 1935 survey Dr. WARREN found that many patients in public hospitals were treatable to the extent of getting home; and the London surveyors write of "the reproach of the masses of undiagnosed and untreated cases of chronic type which litter our Public Assistance Institutions." Quite apart from the cruelty of such neglect, the serious want of accommodation and nursing care for the old and infirm makes the waste of a single bed a crime. Reports of old people dying in circumstances of great loneliness and hardship are increasingly common and shocking; some characteristic examples were reported from Kent recently,[5] where, despite a waiting-list of 700, beds are still having to be closed.

Sir ALEXANDER MACGREGOR[6] has proposed in Glasgow that all patients should have a preliminary investigation and a period of treatment before being judged incapable of benefiting further; and even then they should still be under skilled medical care. Lord AMULREE and Dr. STURDEE endorse the suggestion that general hospitals should have some chronic wards, as well as small annexes for various types of long-stay patients; Sir ALEXANDER MACGREGOR put the proportion at 10–20% of the hospital patients. This plan would ensure that chronic patients received the skilled treatment for which Dr. WARREN pleads, and that their disabilities were accessible for research and teaching. From the patient's standpoint the idea may be less attractive: it is not easy to give the wards of a general hospital the homelike aspect which the chronic patient needs and values. Indeed, the surveyors noted that transfer of public-assistance institutions to the public-health service sometimes means the loss of precious amenities—pocket-money, tobacco, and small comforts of a non-medical kind. The small voluntary home and the specially planned hospital probably suit best all chronic patients who do not need expert medical care: the great dump-heap institution, under whatever name it is disguised, should be avoided at all costs.

At present housing and domestic difficulties are driving thousands of old people on to the waiting-lists for hospital beds simply because they have nobody to look after them, and a high proportion of fatal accidents yearly befall old people living alone, or under conditions where such slight disabilities as they have expose them to danger—the rheumatic hip which is not equal to the turn of the stairs, the failing sight and hearing which give no warning of oncoming traffic. The more intelligently and kindly a community looks after its old people, the less the need for expensive institutional care. Of late years several useful experiments have started, including the hostels of the Old People's Welfare Committee, the home-helps system established by the Council of Social Service at Plymouth, and housing specially designed for the old at Glasgow, Northampton, Farnham, and elsewhere. Much more provision on these lines is needed, and all new housing estates should include a proportion of dwellings specially designed for the old. Given domestic help, nursing care, and medical attention when needed, many old people who now die after years in hospital could live interesting and possibly useful lives at home, finally dying triumphantly in their own beds. If we are to live longer, as statistics show we must, and if the ratio of the old to the young is doomed to rise, we shall probably have to work a little longer. Experience in Glasgow[7] has again brought out the fact that old people like to be useful and to go on earning a little extra money provided they can do it in their own time and at their own rate. Dr. JOHN CAHILL[8] recently recalled the penetrating remark of CICERO: "Old men retain their faculties provided their interest and application continue." In some these qualities are lost early, but in many they will survive if encouraged. Old people who live among the other generations and see life going on around them are well placed for keeping their interest and application.

At the moment, however, building schemes for the old can only share as one small item in the housing programme. Meanwhile there are institutional beds enough intended for the old and infirm if we could get the nursing and domestic staff to man them. Unfortunately good hospital accommodation prepared for long-term patients is apt to be diverted sooner or later to the use of more "interesting" cases. The fact that the chronic cases are looked upon as boring shows how little attention their problems have had. This is where Dr. WARREN's plea for "a change of attitude" is so sound. It is idle to make general paper schemes for the welfare of the chronic sick if no nurse or ward-maid wants to go near them; or to describe their care as "a social service of the first importance" if nurses are taught to think training in chronic wards is second-rate. While municipal hospitals have done all too little for the "chronics," the voluntary hospitals have sometimes been guilty of

1. Hospital Services of London and the Surrounding Area. H.M. Stationery Office. 1945.
2. *Medical Officer*, March 16, p. 99.
3. Eason, Sir H., Clark, R. V., Harper, W. H. Hospital Services of the Yorkshire Area. H.M. Stationery Office. 1945.
4. See *Lancet*, March 16, p. 383.
5. *Ibid*, Feb. 9, p. 209.
6. Quoted by Amulree and Sturdee (ref. 2).
7. Curran, M., Hamilton, J., Orr, J. S., Poole, W., Thomson, E. N. *Lancet*, Feb. 2, p. 149.
8. *Medical Press and Circular*, Feb. 27.

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using the absence of this despised class from their wards as a bait to attract nursing students. And in so doing they have reflected all too clearly the general attitude of our own profession.

Dr. WARREN suggests that apathy and neglect should be countered by making geriatrics like pædiatrics, a specialty in medicine. Both ends of life have special problems and in hospital departments devoted to the peculiar disabilities of the elderly we may learn much about the care, treatment, and prevention of conditions which fill up hospital beds unnecessarily, and which cause a great deal of avoidable suffering.

Annotations

ADMINISTRATIVE ASPECTS OF RADIOTHERAPY

DESPITE the shortage of men and materials, the National Radium Trust and Radium Commission [1] can report steady progress in 1944–45. Although shared by general medicine, these difficulties are particularly noticeable in a new specialty such as radiotherapy which requires elaborate and expensive equipment. The passing of the Cancer Act in 1939 extended the duties of the Radium Commission to include supervision of all radioactive substances and all types of apparatus for the production of radiations in this country. Another responsibility is likely to be added. Until now the commission has controlled the provincial radiotherapeutic centres but not those in London where King Edward's Hospital Fund has provided the radium and determined the conditions under which it should be used. Conferences between representatives of the two bodies and of the London centres have been held in the hope of bringing the London hospitals into a comprehensive organisation of radiotherapy for the whole country. The Radium Commission is taking the lead in advocating a general medical organisation by regions; this is regarded as essential because the treatment of cancer can be satisfactorily carried out only if surgery and radiotherapy are in intimate association. A serious obstacle is the present shortage of radiotherapists; there is an urgent need for the release of trained radiotherapists from the Services and for training facilities for suitable candidates. Reports from the individual centres show that nearly all were treating increasing numbers during the last months of the war, and that all are faced with the need for rapid extension as they enter the post-war period. Birmingham, Manchester, and Wolverhampton already have plans for new buildings, because they cannot accommodate all the patients applying for treatment, and Bristol, Cardiff, and Sheffield—all major centres—report that early expansion of all their facilities is necessary. The new system of cancer records was put into use at 24 centres on Jan. 1, 1945, after a three months' trial period, and has made a good start. A national scheme for the collection of cancer statistics will make a valuable contribution to the efficiency of cancer treatment, and the scheme should be extended to every hospital where such treatment is undertaken. The Ministry of Health have asked the commission to estimate the quantity of radium which will be wanted for medical purposes in the post-war years. Considerable development of radium beam therapy is expected and as much as 200 grammes of radium may be needed.

With this annual report are published, as appendices, abstracts of the reports of the trust and commission for the war years, unpublished before because of paper shortage. These reports reveal how an important national service was kept going through the difficulties of blitz, dispersal of radium, and evacuation. The offices of the commission were badly bombed and some of the records destroyed; much valuable X-ray apparatus was lost and required replacement; radium had to be placed in safety and the manufacture of radon organised in safe areas. In spite of this, work went on steadily, and many visits were paid to centres where new organisation under the Cancer Act was under discussion. The need for X-ray therapy apparatus of foreign manufacture was brought to the notice of the Minister of Health, and the Ministry of Supply arranged for its importation. Finally the statistical committee prepared the system of recording which has been accepted and issued by the Minister of Health. It is a record of which the trust and commission may well be proud.

1. Sixteenth Annual Report of the National Radium Trust and Radium Commission 1944–45. Cmd. 6817. H.M. Stationery Office. Pp. 71. 1s. 3d.

SURGICAL ACCIDENTS TO COMMON BILE-DUCT

EVERY cholecystectomy carries the potentialities of damage to the common bile-duct, and, unless it is rapidly fatal, no surgical accident can cause greater misery in a shorter time. The common bile-duct is most often tied or wounded by the careless or inexperienced surgeon, but disaster may overtake even the elect in the presence of congenital abnormalities or dense adhesions. If the damage is recognised at the time, or at the end of the operation when the surgeon comes to examine the specimen, the situation is still retrievable. Immediate bile-duct suture is feasible, drainage being provided down to the suture line as recommended by Grey Turner,[1] or a T-tube being introduced into the duct at a point distant from the suture line as practised by Cattel.[2] Unfortunately damage to the common duct often escapes immediate recognition, and by the time when jaundice or a persistent biliary fistula reveals what has happened Nature's efforts at repair will have obliterated the normal anatomy of the whole area. Then only a tedious dissection and a high degree of technical skill can hope to remedy the situation. In the more fortunate cases a localised stricture of the duct may be found which can be excised with end-to-end suture. More often the duct has been completely divided, and, though the hepatic end is recognisable by its distension, the duodenal end has either retracted so far that it will not bridge the gap or has lost its lumen and cannot be discovered even on retrograde bouginage via the duodenum. Much thought has been expended on these cases. It may be possible to anastomose the choledochal stump to the stomach, the duodenum, or the jejunum. The track of an external fistula has been dissected out intact and reimplanted into the intestine. Walton [3] has described an ingenious technique by which a flap of duodenal wall is raised and formed round a rubber tube into a channel which can be sutured to the hepatic end of the common duct. In similar fashion McCurrich [4] has used the pouting cone of mucosa which can be withdrawn from the duodenum after its muscular coats have been incised. Brilliant successes have followed these difficult operations, but sometimes the patient again develops jaundice, rigors, and all the symptoms of a progressive cholangitis.

Cholangitis following a successful repair is due either to fibrosis and stricture at the suture line or (probably more commonly) to reflux of food up the bile-duct. The surgeon cannot yet fashion a sphincter of Oddi to guard the entrance of his new duct, and even after a technically successful operation a barium meal may show air and flecks of barium in the biliary tree. Reflux of food can only be prevented by keeping the main line of the alimentary tract well away from the new entrance of the bile-duct, and stricture formation is almost certain unless the whole channel, including the suture lines, has a continuous lining of healthy mucosa. In America, Allen [5] and Cole and colleagues [6] have recently discussed

1. Grey Turner, G. *Lancet*, 1944, 1, 621.
2. Cattel, R. B. *Surg. Clin. N. Amer.* 1943, **23**, 701.
3. Walton, A. J. *Brit. J. Surg.* 1921, **9**, 169.
4. McCurrich, H. J. *Ibid*, 1944, **31**, 304.
5. Allen, A. W. *Ann. Surg.* 1945, **121**, 412.
6. Cole, W. H., Ireneus, C., Reynolds, J. T. *Ibid*, 1945, **122**, 490.

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this double problem of reflux and stricture formation. Both recommend transection of the jejunum, suture of the distal cut end to the choledochal stump at the portal fissure, and end-to-side anastomosis of the proximal jejunum to the distal two feet below this junction. In effect this use of a defunctioned loop of jejunum increases the length of the common bile-duct to two feet and Cole and colleagues take additional precautions against reflux by infolding the walls to form valves. They also sew a shouldered 'Vitallium' tube into the choledochal stump to guard against stricture at this point and they believe that the tube can remain in situ without detriment. Allen prefers to splint his junction with a catheter, which by a clever piece of technique he can remove in three weeks. One advantage of a vitallium tube is that it may be Y-shaped if the common duct is totally destroyed and the stumps of two hepatic ducts are all that remain. Time will decide the efficacy of these remedies.

THE POOL OF SCIENTISTS

RATHER less than 2% of British people reach the universities; yet about 5% of the whole population show, on test, an intelligence as great as the brighter half of university students. The great bulk of the intelligent people who do not reach the universities are ex-pupils of the elementary schools. Sir Alan Barlow and his committee on scientific man-power[1] remark that if university education were open to all on the basis of intelligence alone about 80% of the students would be drawn from elementary schools, whereas at present the figure is about 40%. In other words, elementary-school children now get about half as many places in the universities as would be expected on an intelligence basis, whereas children from independent schools get three times as many. Admittedly not everyone with the requisite intelligence has the other capacities which will enable him to benefit from a university career; but it remains largely true that we are not educating most of the best brains in the country to their full capacity; and that in England and Wales opportunities of going to the university are far less than in the United States and in many European countries.

This waste of raw material applies to all kinds of education, but the committee naturally deal only with science students, who are needed in far greater numbers than the universities can accept. They would deprecate, however, any attempt to meet this need for scientists and technologists at the expense of other subjects, or to give preference to science students in matters of military service. They estimate that by 1950 we shall need 70,000 qualified scientists, and by 1955 we shall need 90,000; but the highest output to be expected from the universities (even if they expand to the extent proposed in their returns to the University Grants Committee) will only bring the numbers up to 60,000 in 1950, and 64,000 in 1955. Sir Alan Barlow's committee therefore maintain that the universities should expand on a much larger scale than they now contemplate, and should aim at doubling the present output, as soon as possible, so as to produce 5000 new scientists yearly. This development must be sponsored by the Exchequer. British universities have never been lavishly subsidised by the State. In 1938 they received about £3,000,000 from the Exchequer and from local authorities; American universities, serving a population only three times as large, received that year £32,000,000 from public funds. For the financial year 1946–47 British university grants have been raised to £9,450,000, and the Chancellor of the Exchequer has told the University Grants Committee that he is willing, if good cause is shown, to ask Parliament to vote even larger sums.

Shortage of teachers is regarded as a bar to expansion in some universities, but the committee believe that enough good teachers would be forthcoming in response to a vigorous recruiting campaign. A larger proportion of staff, they suggest, should be appointed directly to the grade of lecturer. Oxford and Cambridge, which contemplate no expansion, should regard it as a duty, they think, to contribute to the country's greater need for graduates. All the other universities have plans for growth, most of which could be extended still further; even the Scottish universities could afford to grow. They suggest, too, that at least one new university might be founded, remarking ominously: "There is some reason to believe that a number of able teachers from the existing universities would welcome the opportunity of re-enacting in the twentieth century the exodus which is said to have led to the foundation of Peterhouse in the thirteenth." The universities should also train a high proportion of the nation's first-class technologists, and some of the technical colleges should offer courses of university-degree standard.

In allocating our present limited supply of scientists the committee suggest that teaching and fundamental research should have first claim, civil science, whether Government or industrial, coming second, and defence science third on their list. For while it is important to maintain an adequate nucleus of able men at work on problems of defence, our chief need is to ensure an ample supply of scientists and teachers of scientists in years to come. Even if all the committee's suggestions are rigidly carried out, the scarcity will continue for at least ten years.

1. Report of a Committee on Scientific Man-power appointed by the Lord President of the Council. Cmd. 6824. H.M. Stationery Office. Pp. 26. 6d.

FEAR OF VENEREAL DISEASE

THE gruesome widow who has recently appeared on the hoardings as part of the campaign for road safety (incidentally proving irresistible to boys with chalks and a flair for artistic elaboration) raises the familiar educational problem of whether people can be deterred by threats and warnings from doing things they ought not. Those who accept the deterrent principle in fixing the penalties for crime believe that they can, and most parents at one time or another put the principle into effect. The question also has to be faced by those who educate the public regarding health and disease, and in our correspondence columns Dr. Haden emphasises the dangers created by too forceful a propaganda about the symptoms of venereal disease.

The exaggerated fears which health posters may raise in susceptible people do not differ in kind from many other hypochondriacal fears, or indeed from anxieties that have little to do with disease but centre rather on economic or moral troubles. It is questionable whether the information about venereal diseases now forced on public attention has done anything to increase the total amount of hypochondriacal fear in the community, though it may have done a good deal to concentrate it on syphilis. Long before this campaign was launched the unwarranted fear of syphilis was a familiar cause for the attendance of patients at V.D. clinics. Psychiatrists too saw many patients who were convinced that illicit intercourse had brought about a venereal infection; a sense of guilt and a fear or conviction of disease were thus manifested in a single symptom. No doubt many of the patients to whom Dr. Haden refers had symptoms of anxiety long before their fears of venereal disease came to the fore, and valuable though thorough examination and consequent reassurance are to such patients it often requires more than these to free them from their morbid fears.

To balance the advantages against the disadvantages of a propaganda which stresses dangers and penalties is not easy; but there is good reason to believe that in the case of venereal disease the advantages far outweigh the disadvantages—that ignorance does far more harm than needless fear. Too much importance can easily be ascribed to the effect of public advertisements in determining hypochondriasis. If their ill effects

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are to be minimised by veto or reform, it would be more valuable to start with patent-medicine advertisements than with propaganda regarding the risks of venereal disease. And in the long run positive social reforms are more likely to reduce the incidence of both hypochondriasis and venereal disease than crude measures which either stress the dangers of disease or suppress any reference to them.

TRAINING THE MENTAL NURSE

THE Crichton Royal Hospital, Dumfries, was the first mental hospital to give lectures and systematic training to its nurses—beginning in 1854. In 1945 it was the first mental hospital to start a preliminary training school and to introduce the block system of nursing training. We learn from the report[1] of the physician-superintendent, Dr. P. K. McCowan, that during the past year it has made another practical contribution in this field.

Unlike most mental hospitals, the Crichton Royal is not seriously short of nurses, and is even able to select them to some extent. Prospective candidates are tested by methods introduced to psychiatry by Mr. J. C. Raven, M.SC., director of psychological research to the hospital. Raven's matrix test and the Mill Hill vocabulary test are used. The student nurse spends two months in the preliminary training school, attending lectures and demonstrations from doctors, sister tutors, occupational and recreational therapists, the psychiatric social worker, and the psychologist. She enters the wards with a prepared mind, grounded in the principles of the treatments she will see applied; and throughout her course she takes an active part in applying these treatments. She thus becomes a valuable member of the clinical team. In her subsequent two years of training she returns to the school for a block period of two weeks in each year, when she is at liberty to devote herself wholly to the study of theory. The block system is sometimes criticised because the nurse is said to forget all but the broad outlines of her studies between blocks. At Crichton Royal this difficulty has been overcome by a course of study, set by the sister tutor, which runs throughout her training, and which includes the submission at weekly intervals of written answers to questions about her work. She is thus not entirely relieved of the double burden of nursing and study, which the block system is designed to end; but domestic help in the wards has lightened her work in other ways and probably evens things up. Her practical teaching comes, of course, from the ward sister; and it is recognised that these senior members of the staff need to know not only what recent advances have been made in psychiatry but what the sister tutor has been teaching students in the block periods. Short postgraduate courses have therefore been arranged for the senior staff. Sisters and staff nurses have been withdrawn from their wards in groups of ten to attend courses lasting a week, and already nearly all the men and women on the senior staff have attended.

Here at last are the beginnings of better training for the mental nursing service. It is to be hoped that other hospitals will quickly follow this important lead.

AIDS TO DIAGNOSIS OF BRONCHIAL CARCINOMA

BRONCHIAL carcinoma is often difficult to recognise. The symptoms are variable and inconstant, particularly in the early stages, and radiology cannot do more than indicate the character and position of an abnormal shadow in the lung. Conclusive evidence can be obtained only by seeing the actual growth through a bronchoscope and obtaining a positive finding from a biopsy specimen. Unfortunately there are many occasions when the growth lies beyond the limit of bronchoscopic vision—for example, when it is situated in the upper lobe. Other aids to diagnosis are then required, and of these aspiration biopsy and examination for malignant cells in the bronchial secretions deserve consideration.

Aspiration biopsy is, on principle, to be condemned if there is any prospect of surgery being employed. The needle must traverse the pleural layers before entering the lung and suspected area of growth. If the pleural layers are adherent the danger to this cavity is removed but the chances of excision are reduced if the adherence is extensive and firm. Opinions differ on the value of examining the sputum for malignant cells,[1] but there seems little doubt that it can be extremely useful in expert hands. The recognition of malignant cells has often established the early diagnosis which is essential if radical treatment is to be practicable. But the technique and identification of the cells found can only be undertaken by experienced and practised workers, and this probably accounts for the divergent views expressed on the method. Definite fragments of growth and clumps of malignant cells are easily recognised, but isolated carcinoma cells can readily be confused with the epithelial elements which are to be found in any sputum. For this reason it is unwise to depend on a specimen taken within a fortnight of bronchoscopy, which by abrasion of the delicate mucosal surface may free microscopical quantities of epithelial cells. In their modification of the sputum-cell examination method, Herbut and Clerf[2] combine bronchoscopy with direct aspiration of all secretions from the bronchi of the suspected area. The material is converted into smears while still wet and is fixed and stained; 5 slides are made and examined in detail. They claim that this bronchoscopical examination of the secretions gives more information than examination of the sputum for malignant cells and can be used as an adjunct to the routine bronchoscopy that would be made in any case of suspected pulmonary carcinoma. Their criticism of sputum-examination methods is based on quotations which are mainly drawn from the period before Dudgeon's publication.

More extensive use of both methods of investigation will undoubtedly provide an earlier diagnosis in cases where routine investigation has been inconclusive.

ROYAL SANITARY INSTITUTE

THE institute's annual congress, the first since the Scarborough meeting of 1939, was held at Blackpool from June 3 to 7. Lord Woolton, in his presidential address to an audience of over 2000 delegates, members, and visitors, appealed for humanity in government, particularly in local government. He spoke of the blunting of sensibilities that comes from remote control: "the needs of the people are not the needs of the people en masse but the needs of the individuals that make up the mass." There was a danger of the new organisations with which we were experimenting being too large and too remote to deal with the individual needs that had prompted their creation. It was the work of the institute to teach the public the wisdom of taking positive action to raise the health of the whole community. "We are all of us more frightened of death than we are anxious about the preservation of life." The message of health instruction should, he suggested, be truly educational and the methods not simply those of didactic propaganda. As a debtor nation we could not afford to be anything but healthy. "Ill health is one of the luxuries of a prosperous society."

1. 106th annual report of Crichton Royal, Dumfries, for the year 1945.

1. Dudgeon, L. S., Wrigley, C. H. *J. Laryng. Otol.* 1935, **50**, 752. Barrett, N. R. *J. thorac. Surg.* 1938, **8**, 169. Gowar, F. J. S. *Brit. J. Surg.* 1943, **30**, 193. Craver, L. F. *Surgery*, 1940, **8**, 947.
2. Herbut, P. A., Clerf, L. H. *J. Amer. med. Ass.* 1946, **130**, 1006.

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Special Articles

GENERAL MEDICAL COUNCIL

COMPOSITION AND DUTIES

NEITHER the medical profession nor the public have paid much attention to the constitution of the General Medical Council until comparatively recently when its disciplinary procedure has come in for a good deal of criticism. The imminent revolution in medical practice implied in the National Health Service has increased the movement towards reform, and within a short time the council itself, the British Medical Association, and the medical defence societies may be expected to publish their conclusions on the subject. The following account of the council's present constitution is intended to serve as a background against which the reformers' proposals may be examined.[1]

STRUCTURE AND FUNCTION

The General Council of Medical Education and Registration of the United Kingdom was established by the Medical Act, 1858. The object of this Act was to set up a register of practitioners whom the public would know to have been adequately trained, and the principal function of the council is to keep this register. All the other functions of the council, of education and erasure, are subservient to this central aim of giving the public a list of trustworthy doctors; and in considering the council this fact should never be forgotten.

The constitution of the council has been amended by the Medical Council Act, 1862, and the Medical Act, 1886. In addition, certain universities have been given representation by private Acts.

The present council consists of 39 members. Five are nominated by the Crown; three are appointed for England, one for Scotland, and one for Northern Ireland. One member comes from each of the Royal Colleges of Physicians and Surgeons of England, Scotland, and Ireland, the Apothecaries' Society of London, the Royal Faculty of Physicians and Surgeons, and the Apothecaries' Hall of Ireland. Eighteen members come from as many universities with medical schools. The general body of practitioners is represented by five members for England, one for Scotland, and one for Ireland; this "direct representation" was established by the 1886 Act. University representatives and Crown nominees may be laymen, but for many years the only layman on the council has been one of the Crown nominees—at present Lord Hacking. Members hold office for five years and are eligible for re-election or reappointment. Elections are held every five years and whenever vacancies occur, but election was suspended during the war by emergency legislation.

The council is divided into branch councils for England, Scotland, and Ireland. Eire has had its own medical council and register since 1927; by agreement the Irish licensing bodies may grant qualifications registrable by the G.M.C., and persons on the British register are entitled to registration on the Irish register. The 1862 Act made the council a corporation with the usual properties of perpetual succession, a common seal, and the capacity to hold land for its statutory purposes.

Each of the branch councils has a separate register, and the 1858 Act obliges the registrars to keep their registers correct, erase the names of all persons who have died and make necessary alterations. The council is obliged to register qualifications which are registrable by statute, subject to payment of a fee of £5. The registrable qualifications are diplomas in medicine, surgery, and midwifery granted after examinations held for the purpose by a legally qualified university or medical corporation in the United Kingdom, or by a combination of universities or associations. Candidates must show that they possess the knowledge and skill required for efficient practice. The form of the register is scheduled in the Act.

The G.M.C. works under the supervision of His Majesty's Privy Council, which may notify to it an opinion that it has not maintained a sufficient standard of proficiency at any examination, or that it should appoint assistant examiners, or perform any one of its statutory functions. If the G.M.C. fails to comply, the Privy Council may act in its place. The G.M.C. may recommend to the Privy Council that a licensing body shall be deprived of representation or granted representation, or that an additional representative shall be elected by any part of the Kingdom. Such recommendations must be tabled in Parliament before the Privy Council deals with them. The G.M.C. has no jurisdiction over the licensing bodies, but through its power to recommend that their standards are insufficient for registration, it exercises very real power. If the Privy Council, after inquiry, declared that the qualifications of a given licensing body did not entitle a candidate to registration, not only would candidates of that body be ineligible for registration but it would cease to be represented on the council. Hence the coöperation between the council and the licensing bodies aimed at maintaining the standard is very close and effective.

The council appoints visitors to attend the examinations of the licensing bodies. Their reports are laid before the council, who are obliged to send a copy to the licensing body concerned and to the Privy Council.

Besides the other registrable qualifications, the council registers the diploma in public health set up by the Act of 1886. This Act also contains powers under which the Privy Council may authorise the G.M.C. to recognise a diploma granted in a foreign country which gives British-registered practitioners just privileges of practising within its borders. Unfortunately no reciprocity at present exists with any other non-Empire country under this provision.

The council also has the duty of publishing the *British Pharmacopœia*, which is described by the 1862 Act as "A book containing a list of medicines and compounds and the manner of declaring them, together with the true weights and measures by which they are to be prepared and mixed, and containing such other matters and things relating thereto as the General Council think fit." The Pharmacopœia Commission, a body responsible to the council, carries out the practical research work on which the *B.P.* is based.

The council's executive committee is set up by virtue of the 1858 Act, and the council may delegate such of its powers as it sees fit to this committee, except the power of making representations to the Privy Council. The council has never attempted to delegate its disciplinary powers to the executive committee, and probably in view of the language of section 29 of the 1858 Act, which deals with discipline, it could not do so. The court has held that it cannot delegate dental disciplinary matters, which are governed by the Dentists Act, 1921. A penal cases committee, however, decides in advance which cases shall come before the council for inquiry.

The council elects its president for five years and he is eligible for re-election. It appoints its own registrar and secretary, who is also registrar of the English branch council. It has full discretion to appoint other members of its staff. Members attending sessions are paid attendance fees and travelling expenses on a scale approved by the Treasury.

DISCIPLINARY POWERS

The 1858 Act provides for the removal of the names of practitioners from the Medical Register in various circum-

1. Fuller information may be found in Mr. D. H. Kitchin's paper published in the *Medico-Legal Review* (1939, 7, 227).

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stances. The registrar writes letters at regular intervals to all registered practitioners inquiring whether they have ceased to practise or have moved; if a letter is not answered within six months, the registrar may erase the practitioner's name (section 14). To have his name restored, a practitioner must satisfy the council of his identity. Again, under section 26 of the 1858 Act, if a branch council or the General Council are satisfied that an entry has been fraudulently or incorrectly made, the council may order it to be erased without notice to the practitioner. The court has held (R. *v.* G.M.C. ex parte Kynaston, 1930, 1 K.B. 562) that a practitioner's name cannot be removed at his own request. A dentist, however, can have his name removed under the Dentists Act, 1921.

Penal erasure under section 29 of the 1858 Act is the function of the council which has attracted the most public attention and criticism. This section consists of two parts, one dealing with cases where practitioners have been convicted in criminal courts of the United Kingdom, and the other where the practitioner is charged originally before the council with infamous conduct in a professional respect. In the former case all that is required is proof of the conviction; in the latter the council may "after due inquiry" order the registrar to erase the name of a practitioner whom it finds guilty of infamous conduct. The section provides that no person may have his name erased because he has adopted any particular theory of medicine and surgery. Conviction before a court-martial or a court of another country, or a finding by a divorce court against a doctor that he has committed adultery with a patient or a member of a patient's family, are not convictions within the meaning of the section and the facts must be inquired into. If a doctor has been "convicted" within the meaning of the section, he may not seek to disprove the facts which the court found proved. The council was inclined to apply this rule to the findings of the Divorce Court, but the House of Lords held in the case of R. *v.* G.M.C. ex parte Spackman (1943, A.C. 627) that this was wrong and that a practitioner might bring evidence traversing the findings of the Divorce Court.

In making its "due inquiry" the council uses a procedure approximating to that of a criminal court but differing in many essentials. Both sides may be represented by counsel or solicitor, but the council has no power to compel witnesses to attend, and in the result a responding doctor is often placed at a serious disadvantage in defending himself. Nor may it direct witnesses to take the oath, nor award costs against an unsuccessful complainant or respondent. It is not bound by the ordinary rules of evidence, and may consider statutory declarations even if the deponent is not present to be cross-examined, or receive hearsay evidence.

In announcing its findings the President gives no reasons. The council may and often does hear disciplinary cases in private, merely announcing the result in public.

The only sentence is erasure, for the council does not punish, but merely keeps the register clean. However, the council frequently adopts the device, especially in cases involving drink or drugs, of suspending judgment for a given period and requiring the practitioner to bring evidence of his good conduct in the interval. A practitioner has no right of appeal from a direction of erasure; but he may at any time apply for the restoration of his name, and the council may if it thinks fit order the registrar to restore it. Medical restorations are by custom made in the November session of the council.

A doctor is not forbidden by law to practise after erasure, but he may not claim to be registered nor use dangerous drugs, nor most poisons, nor hold public appointments, nor give official certificates.

DENTISTS

The Dental Board of the United Kingdom was set up by the Dentists Act, 1921, to keep the Dentists Register. It has similar powers to those of the council, but its decisions must be confirmed by the council, which when considering dental matters is augmented by three dental members. A dentist whose name is erased from the register may no longer practise, and perhaps for that reason has a right of appeal to the High Court, which may rehear the whole inquiry.

The chief features for which the council's disciplinary powers have been criticised are the unwieldy size of the tribunal, its constitution of elderly medical men of limited experience of general practice and judicial ability, the poor quality of the evidence on which it is obliged to make its decisions, and the absence of an appeal. Critics have also declared that the general body of practitioners is not adequately represented either in disciplinary or in educational matters.

THE RECENT SESSION

After the President had concluded the address reported in our last issue, Prof. G. A. CLARK moved, and Mr. R. A. STONEY seconded, a vote of thanks.

DENTAL RESTORATION

The Registrar was directed to restore to the Dentists Register the name of *Arthur Groom*, erased in May, 1939.

THE CASE OF DR. HENNESSY

After announcing the restoration of Dr. *Arthur Henry Hennessy's* name to the Medical Register, the President said:

"I have been asked by the council to add a few words to this formal announcement.

"This is a case in which a judge of the High Court, in a judgment delivered by him on April 12, 1946, intimated that the council (to quote the learned judge's own words) 'not having the advantage of the great mass of evidence that had been put before him and which was not put before them,' had 'in the absence of adequate evidence (and they could only deal with the matter on the evidence before them)' come to a conclusion adverse to the practitioner which had resulted, in the firm and clear view of the learned judge, in a gross miscarriage of justice.

"The transcript of the additional evidence has been carefully considered by the council, and in view of this additional evidence the council have taken the earliest opportunity of restoring the name of the practitioner to the register.

"But I must emphasise that it is imperative in all inquiries held by the council under section 29 of the Medical Act, 1858, that an accused practitioner should call before this council all material and relevant evidence in support of his case. If he neglects to do so, he does so at his own peril. This council can only deal with any case on the evidence before them. If there is evidence that is relevant and that could be adduced on behalf of the practitioner and is not so adduced, the responsibility of any adverse view by the council must rest with the accused practitioner."

Dr. Hennessy's name was erased in June, 1945. Notes on his successful slander action against the complainant appeared in THE LANCET of April 27, pp. 616 and 622.

COMPLAINTS OF APPROPRIATION OF PATIENTS

Dr. *Bernard John Barnett*, registered as of Essex Villa, Attleborough Road, Nuneaton, M.D. Alberta (1931), appeared before the council on the complaint of Miss Alexandra Florence Hays, of Woodford Halse, Northants, charged with canvassing for the purpose of obtaining patients, with causing to be exhibited a notice inviting insured persons to transfer their names to his panel, and with failing to pay or account for moneys received as a locum tenens. Mr. C. Morgan Blake (instructed by Messrs. Field, Roscoe and Co., solicitors), who appeared for Miss Hays, said that her father had died in 1941 and she had since then carried on his practice by means of locum tenens. In November, 1944, she had employed Dr. Barnett. Her solicitors had drafted an agreement containing an option to purchase the practice and a restrictive clause prohibiting him, if he left the service of the practice, from practising within 10 miles of Miss Hays's home at Woodford Halse for five years. He did not complete this, saying he could not find the money, and on May 14 gave a month's notice to terminate the

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employment. After the month had expired he set up practice in a lock-up shop in the same village. He had taken with him the current visiting list, the dangerous drugs register, and the cards on which were noted attendances of patients coming from two deposit societies. The panel had had 940 names at the time he left, but the total was now only 516. The offending notice had been exhibited on railway land under the heading "National Union of Railwaymen, Woodford Branch."

Miss Hays gave evidence of the employment of Dr. Barnett and its termination. Mr. W. E. Hobbs, a retired railway vehicle-builder, said that on August 30, 1945, he had seen two women, Mrs. Woods and Mrs. Spencer, looking at Dr. Barnett's surgery, which had a notice in the window. The doctor had come out and asked them if they wanted to change to bring their medical cards before October 1. Mr. Hobbs had been so impressed by what he had considered a breach of medical etiquette that he had promptly gone home and written down the exact words. He said he kept a diary regularly, in which he noted down conversations and events which interested him, but he had not made this note in his diary.

Mr. H. D. Peacock (instructed by Messrs. Le Brasseur and Oakley, solicitors, on behalf of the London and Counties Medical Protection Society), who appeared for Dr. Barnett, submitted that no case had been made out, but the council directed him to proceed with the defence. He accordingly called Dr. Barnett, who said he had set up in practice on his own in a shop, the windows in front of which were painted and boarded up so that persons outside could not be seen from the surgery. He had not canvassed any patients, and had not even known of the existence of the notice on the railway premises. He could not recall anything which could be a basis for Mr. Hobbs's story. Probably some of his panel patients had formerly been patients of Miss Hays's practice. He said he had kept the money given him by practice patients because he had been owed a considerable sum for salary and accommodation. He had not replied to solicitors' letters because he had expected the matter to be reported immediately to the council and had intended to straighten it out there. He had spent £67 belonging to Miss Hays in order to live, and would settle with her when she paid him his salary. He had been living on a loan and proceeds of his practice. He denied taking away the records.

Mr. W. J. Jalland, secretary of the union branch, said he had known the practice for ten years, during which time Miss Hays had employed between 12 and 15 locum tenens. As far as he was concerned for his union members, the state of affairs was definitely unsatisfactory. He had caused the notice to be exhibited on eight union notice-boards, entirely without Dr. Barnett's knowledge. He had taken them down after a conversation with another practitioner of the neighbourhood.

The council found proved against Dr. Barnett only the charge of failing to pay over moneys received from patients of the practice, and did not on that charge find him guilty of infamous conduct.

Mr. *Rhys Vaughan Powell*, registered as of 41, Wimpole Street, London, W.1, L.M.S.S.A. (1914), F.R.C.S. (1935), appeared on the complaint of Dr. George Max Flemming, a general practitioner, of Sudbury, Suffolk. The charges were that having agreed to enter into partnership with Dr. Flemming, and having practised with him and lived, with his wife, at Dr. Flemming's house with free access to his medical records and lists of patients, he had moved to another address in Sudbury and started to practise there and at a surgery less than a quarter of a mile from Dr. Flemming's house; that he had taken without Dr. Flemming's consent a large file of case-reports and a list of his patients, had treated and continued to treat former patients; and that, while purporting to act as Dr. Flemming's partner and to be ready and anxious to sign a partnership deed, he had gained all the information he could concerning the practice and patients, and had sought to establish his local reputation and prestige, with the intention of acquiring the practice on advantageous terms or of setting up in practice in competition with Dr. Flemming, and that in relation to these facts he had been guilty of infamous conduct in a professional respect.

Dr. Flemming was represented by Mr. F. W. Beney, K.C., and Mr. Hugh Boileau (instructed by Messrs. Metcalfe, Copeman, and Pettefar, solicitors). He said in evidence that, wanting a partner in 1945, he had been put in touch with Mr. Powell by a medical agency and had verbally agreed terms of partnership. Mr. Powell was to pay £750 for a half share. Mr. Powell had started on April 1, 1945, and he and his wife had lived with their furniture in a flat which the Flemmings had made for them in their own house. A draft partnership agreement was sent to Mr. Powell's solicitor. Dr. Flemming and his wife had taken a holiday, leaving the Powells in sole charge. On return, his patients had "looked at him as though they didn't like him any more." Dr. Flemming had signed a copy of the partnership deed but Mr. Powell had not. Mr. Powell owned a very long Bentley car; Dr. Flemming had not been able to garage it but had allowed Mr. Powell use of the runway between the coal and coke sheds. His wife had complained that it obstructed the carriage of fuel, and Dr. Flemming had asked Mr. Powell to get another garage; but he had refused, and said that if he could not garage the car on Dr. Flemming's premises he would not sign the agreement but would leave. This he had done, taking a pile of case-reports and a file which he had compiled concerning patients sent him by Dr. Flemming for consultation. He was now in general practice a quarter of a mile away, and also at a branch surgery in a neighbouring village (in competition with Dr. Flemming). He had taken two appointments without, as the agreement provided, consulting Dr. Flemming. He had written saying he would assume that a partnership had existed and offering to buy Dr. Flemming out, but Dr. Flemming had refused. Dr. Flemming had, since Mr. Powell's removal, lost about 200 panel patients and about half his private patients. Mr. Powell had operated on the wife of one of these and had himself sent in an account for 75 guineas, which was much in excess of the usual charge. The husband had written to Dr. Flemming admitting liability but saying he would hold the money until the question of the ownership was settled, and that he and his wife were no longer patients of Dr. Flemming. They now called in Mr. Powell. Dr. Flemming had been called in to attend one of the nuns at the local convent, and Mr. Powell had performed an operation. As the patient needed another, Dr. Flemming had sent for his usual surgical consultant. Mr. Powell had been angry, and said Dr. Flemming had no business to do this, as he himself had called in a consultant from Ipswich. After a few days Father R. G. Moir, the Catholic priest, had written saying he wished Mr. Powell to take the case over. Mr. Powell had frequently discussed Dr. Flemming and disparaged him to his friends and patients.

Mr. Harry Higginson, clerk to the West Suffolk insurance committee, said that 179 patients had transferred from Dr. Flemming's list to Mr. Powell's between the beginning of October, 1945, and the beginning of April, 1946. Mr. W. J. Beckley, clerk to the Essex insurance committee, spoke of 25 similar transfers.

Mrs. Flemming said that when the Flemmings had returned from a fortnight's holiday in May they had found the position "not entirely satisfactory." It appeared that the Powells had been talking about them to patients and friends while they were away. She had spoken to Mrs. Powell about this, and Mr. Powell had declared that they would not stay and that he was free to set up in practice on his own. Mr. Powell's Bentley had made work difficult and her servant had complained. She had gone out of her way to treat the Powells with every consideration. Sister Desborough-Smith, deputy matron at St. Leonard's Hospital, Sudbury, confirmed Dr. Flemming's account of the dispute over the surgical specialist, and said that Mr. Powell had repeatedly discussed Dr. Flemming disparagingly, and had called him a "rotten anæsthetist."

On behalf of Mr. Powell, Mr. Howard called Father Moir, who said that at the end of May, 1945, when the two doctors had been on the point of breaking off their relationship, Mrs. Flemming had telephoned to say that they had made it up. On Sept. 18 Dr. Flemming had visited the witness and said he had "thrown out his partner Powell" that morning because he was a "thoroughly bad surgeon and a dangerous man." Father Moir had been alarmed for the sake of the nun, who had needed continual surgical attention, but Dr. Flemming, who had been very disturbed and almost incoherent,

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had not given much attention to this aspect. On a request from the nun's superior, Father Moir had told Dr. Flemming that the nun would be Mr. Powell's patient in future. He considered that Dr. Flemming had treated Mr. Powell unfairly, but could give no grounds for this opinion other than that Dr. Flemming had broken off the negotiations.

Mr. Powell said in evidence that he had agreed that Dr. Flemming's solicitor should prepare a draft agreement, but he had received a fair copy with a request for signature. He had sent it to his solicitors. He made a general denial of disloyalty and canvassing. Dr. Flemming used to say very irritating things on the spur of the moment. His friends had asked Mr. Powell how he got on with Dr. Flemming, and he had replied "He's damned difficult." He had also agreed with them in their unanimous judgment that Dr. Flemming was a thoroughly bad car-driver. He had never disparaged him professionally, but had agreed with the deputy matron that it was a pity he would not take a course in anæsthetics. He had been honest in refusing to sign the agreement because he could not garage his car on the premises. He and his wife had left on the night of Sept. 18 after an open breach in which Dr. Flemming had called him a thief. He had never tried to induce a patient to transfer to him, but whenever a patient had suggested this, he had made it quite clear that he was practising on his own. He agreed substantially with the figures given for the transfers. He felt he had a moral right to do what he had done. After six months with Dr. Flemming he had not been able to afford to go elsewhere. Mrs. Powell gave corroborative evidence.

The President announced that the council had found that Mr. Powell, having agreed with Dr. Flemming to enter into partnership with him, having begun to practise with him on April 1 and live at Dr. Flemming's house, with free access to his medical records and lists of patients, had left the house on Sept. 18, moved to The Grove, Sudbury, and started to practise at that address and at a surgery in North Street, less than a quarter of a mile from Dr. Flemming's house, and had treated and continued to treat patients who had formerly been patients of Dr. Flemming's. Nevertheless, in relation to these facts the council had come to the conclusion that Mr. Powell had not been guilty of infamous conduct in a professional respect.

A CONVICTION FOR ASSAULT

James Alphonsus Heerey, registered as of Virginia, co. Cavan, M.B.N.U.I. (1941), appeared in consequence of convictions before petty sessions of inflicting grievous bodily harm on Mr. A. G. Barber and damaging his property, and inflicting grievous bodily harm on Mr. H. E. Jones. Mr. S. Winterbotham, for the council, said that Mr. Barber, who was 73 years old, had been the proprietor of a guest-house at which Dr. Heerey had lodged. There had been some disagreement between the two men. Late one night Dr. Heerey had returned, used foul language, entered the bedroom of Mr. and Mrs. Barber and pulled the clothes off Mrs. Barber in bed. Mr. Barber had closed with him and Dr. Heerey had struck him repeatedly with his fists and gouged the inside of his mouth with his nails. Mrs. Barber had managed to separate them, but Dr. Heerey had broken the door in to get at Mr. Barber again, and Mr. Barber had fallen over the balcony to the ground in trying to escape. He had suffered from serious damage to his eyes and mouth and several other injuries. Mr. Jones, another lodger, who had been summoned to help, had had both eyes blacked and his nose broken. Dr. Heerey had done £24 worth of damage. The police had said he had not been drunk, and he had been allowed to drive away in his own car.

Mr. A. A. Pereira (instructed by Messrs. Le Brasseur and Oakley, solicitors, for the London and Counties Medical Protection Society), declared that the offence was in fact due to Dr. Heerey's intolerance to drink, expressed Dr. Heerey's deep regret and pleaded for leniency. The council suspended judgment for two years, and directed Dr. Heerey to appear again after one year and to bring evidence of good behaviour in the interval.

ALLEGED DRUNKENNESS ON ACTIVE SERVICE

Frederick Percival Melville Anderson, M.B. Edin. (1926), appeared after dismissal from the Army by court-martial. Mr. Winterbotham explained that he had been found guilty of two groups of charges: (1) of fraudulently misapplying a considerable quantity of rum and whisky, issued for use in his military hospital, to his own use; and (2) of drunkenness on three occasions on active service and assault on an Indian soldier by attempting to strike him with a stick. Dr. Anderson, who was accompanied by Mr. Oswald Hempson, solicitor, said he had pleaded guilty to the first group of charges. It had been a widespread custom to divert spirits issued for medical use to consumption in messes and for the private use of officers. The practice had, he agreed, been reprehensible, and his predecessor had been dismissed for it. Replacements of spirits had been habitually flown in by the R.A.F. from Calcutta, and so the conversion had not amounted to more than an irregular borrowing. To the other group of charges he had pleaded not guilty, and he stoutly denied their truth. It was said that on one occasion he had entered the operating-theatre ungowned and drunk, and had held an undignified conversation with the patient who was about to go on the table; that he had slapped a mental patient in the face, also when drunk, and had been involved in a struggle with a brother officer, whom he had thrown out of his deck-chair. His innocent explanation of these happenings had been supported by the evidence of other officers, but the court-martial had believed the witnesses for the prosecution. These Mr. Hempson suggested had been actuated by personal spite, and had taken the opportunity, while Dr. Anderson had been away on special duty, of having his conversion of Army spirits investigated and fabricating the charges of drunkenness to accompany them. Dr. Anderson said that when he had returned from special duty he had found the inquiry well advanced, and had been unable to get particulars of the charges until five days before the court-martial. He had been refused legal assistance. After the judgment of the court had been pronounced, he had promptly filed an appeal. Later the office had asked him to send them in the final page, saying they had lost it. He had done this, but had heard no more, though a year had passed. He had lost the benefits of 19 years' service, a large gratuity, and a pension. He produced testimonials which described him as a loyal friend and a conscientious colleague.

The council found that he had been convicted of the charges by a court-martial but that he had not been guilty of infamous conduct in a professional respect.

TUBERCULOSIS AND THE BILL

THE Joint Tuberculosis Council says that at a recent meeting between representatives of the Ministry of Health and of the council, the position of the tuberculosis service in the proposed new National Health Service was outlined as follows:

The tuberculosis service, as it exists at present, will disappear.

"Tuberculosis officers" will become "chest physicians" dealing with all diseases of the chest—i.e., tuberculous and non-tuberculous diseases.

Chest physicians will be in charge of chest clinics attached to hospitals in the new hospital service.

Chest physicians will have no responsibility for cases of non-pulmonary tuberculosis, which will be dealt with by the appropriate departments of hospitals.

Preventive measures and domiciliary nursing and social service will fall within the province of local authorities under the medical officers of health, but chest clinics will be within the regional hospital framework under the ægis of the Ministry of Health. There is, however, no set plan for integrating the local-authority and hospital services except through conferences which will be presided over by the principal medical officers of the respective regions.

Specialist whole-time tuberculosis nurses will be exceptional in future, as tuberculosis cases will be included in the scheme for a general health-visiting and nursing service maintained by local authorities for all purposes.

Rehabilitation in its clinical aspects will be controlled by the Ministry of Health on a regional basis. Rehabilitation in its employment aspect will be controlled by the Ministry of Labour.

The council on May 18 adopted the following resolutions.

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(1) In the opinion of the council, the proposals of the Minister of Health, as outlined in the interview with officials of the Ministry, offer a gravely inadequate substitute for the existing services and constitute a danger to the public health.

(2) The council views with alarm the separation of the social, environmental, and epidemiological aspects of tuberculosis from the purely clinical aspect and considers that, as heretofore, the family and not the patient should be the unit.

(3) The council rejects the assumption that tuberculosis requires no different consideration from other diseases. No matter what may be the particular manifestation in any individual, he requires prolonged special supervision of his mode of life and environment for his own safety and that of the community by someone with special knowledge both of the individual circumstances and of the disease.

(4) In the opinion of the council, no attempt should be made by the Government to break down and disperse the existing tuberculosis service until an alternative scheme is produced which integrates the remedial and preventive aspects of the disease in at least as satisfactory a way as exists in the best schemes of the present day, or until the incidence and mortality of the disease have declined to a low level.

(5) The council believes that the best interests of the tuberculous patient and of the community at large would be served if the existing tuberculosis service and its facilities for prevention, diagnosis, treatment (including institutional treatment), and aftercare were transferred intact from the local authorities to the new national hospital organisation and retained in that organisation as an entity.

(6) The council therefore presses the Minister of Health to direct the new Central Health Services Council, which is to furnish him with advice and assistance on health subjects, to form a standing advisory committee on tuberculosis and to direct the new regional hospitals boards to form tuberculosis subcommittees for the specific purposes of safeguarding the interests of tuberculous patients and the health of the community.

THE CONSULTANT PÆDIATRICIAN

THE British Pædiatric Association has made the following suggestions intended to help centres (other than the main undergraduate teaching schools) which may be considering the appointment of a consultant pædiatrician.

QUALIFICATIONS

A consultant pædiatrician should have received his pædiatric training at an approved children's hospital or children's department of a hospital.

He should have at least five years' training and experience after qualification. One, preferably the first, year of this period of training should be spent in an appointment or appointments in adult medicine or surgery. Three years should be devoted to pædiatrics, using this term in its widest sense to include all medical work among healthy and sick children. One year should have been spent working at some allied subject such as work in a maternity unit, infectious diseases, psychiatric children's department, laboratory work, or travel abroad.

He should be a member or fellow of one of the Royal Colleges of Physicians or hold an approved higher degree in general medicine; the D.C.H. is not essential for a higher post of this type.

He should not engage in general practice.

REMUNERATION

The standards of remuneration should be based upon the assumption that no considerable measure of private practice will be available. In determining these standards for a consultant pædiatrician, whether part-time or whole-time, his services should be valued in the light of the work done and responsibilities assumed. It should be borne in mind that the care of children involves great responsibility.

Travelling expenses in connexion with this work, adequate secretarial and office assistance, and time off to attend meetings of learned societies should be provided.

STAFF OF THE DEPARTMENT(S)

In his hospital work he should be afforded adequate medical assistance of the type of medical registrars and house-physicians and these must be taken into account when assessing the requirements and cost of the department. In order that the best nursing services may be available for the children, the senior nursing staff in the children's department should hold the sick children's nurses' certificate.

DUTIES

He should have general charge of the children's department of the local hospitals, should act as consultant to the local hospital for infectious diseases, should be responsible for the care of the newborn in the local maternity departments, and should also be available as a consultant for long-stay country hospitals, convalescent homes, and residential schools for defective children. He should be consultant to the school health service, the local welfare clinics, the tuberculosis service as applied to children, and any other service for children for which the local authority is responsible; he should be available for domiciliary consultations, as determined by the new Health Bill. He should undertake certain teaching duties for house-physicians, nurses, midwives, health visitors, &c., and in this connexion he should be closely associated with the local university department of child health.

APPOINTMENT

He should be jointly appointed by the appropriate hospital board and local authority concerned, in consultation with the university of the region. It would be an advantage to have some external assessors, such as representatives from another university and the British Pædiatric Association.

The emoluments of the post and the conditions of work should be made as attractive as possible in order that applicants of high standing may be led to apply.

Copies of these suggestions may be had from the secretary of the association at the Hospital for Sick Children, Great Ormond Street, London, W.C.1.

RELEASE OF DOCTORS FROM THE FORCES

THE following is the latest information received by the Central Medical War Committee regarding the dates of release of medical officers in class A:

Royal Navy.—Groups 51 and 52 in July, 53 and 54 in August, 55 and 56 in September.

Army.—General-duty officers: groups 48 in July, 49 in August, and 50 in September. Specialists: group 34 between July 1 and August 15; group 35 between August 15 and Sept. 30.

Royal Air Force.—Groups 35, 36, and 37 in July; 38, 39, and 40 in August; 41, 42, and 43 in September.

The release of individual specialists necessarily depends to some extent on the recruitment of specialists from civilian practice, which is always impossible to forecast accurately. We are informed that "the Central Medical War Committee, with the help of the local medical war committees, is continuing to make every possible effort to increase the yield of new specialist recruits. The standards adopted during the war in the classification of practitioners as specialists and graded specialists have been relaxed, and in certain specialist categories arrangements are being made for reconsideration of the eligibility of potential recruits who in the past have been rejected as medically unfit. The local medical war committees concerned have been asked to show cause why the limited number of specialists still remaining in civilian practice should not now be recruited. No man of military age in a specialty in which recruits are required to facilitate class A releases is escaping attention."

As a result of the recommendations made by the C.M.W.C., a substantially larger proportion of the general-duty officers recruited during the first six months of 1946 has been allocated to the Royal Air Force than to the other Services. Instructions have not yet been received from the Government regarding recruitment in the second half of the year but the committee has urged that a still greater proportion of the new recruits should be allocated to the R.A.F. during this period.

THE MEDICAL DIRECTORY for 1946 contains 70,461 names, an increase of 1458 on the number for 1945. It also records 4070 temporary registrations, an increase of 520 on last year. This is the 102nd annual issue by the publishers, Messrs. J. & A. Churchill. The price is £3 3s.

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In England Now

A Running Commentary by Peripatetic Correspondents

"WHAT is all this rehabilitation talk that the papers are full of?" asked an old friend anxiously. "Does it mean that if I am unlucky enough to break my leg and be taken into hospital I have to learn pottery as well?" One had to tell him that the way things are now the answer was "Yes," and he would be fortunate if nothing worse befell him—felt elephants, for example, or drill by an ex-sergeant-major. He replied firmly that P. G. Wodehouse and a pretty nurse had brought him safely through all the illnesses he had had yet and he desired no other aids to convalescence. Looking back on a life of which far too much has been spent in nursing-homes and side-wards I am inclined to sympathise. The old unplanned days after an operation could be quite good fun.

One recalls lovingly a nursing-home staffed mainly with Irish nurses where an interest in the Sport of Kings pervaded the atmosphere. The day porter supplied us with wholly unreliable tips and collected our shillings and sixpences with the result that the evening paper took on an importance it was not to possess again till the war. A popular night nurse drew a horse in the Irish Sweep just before I was due for a major operation, and the good-natured flutter into which this event threw the whole staff acted as a most welcome distraction from one's personal worries. The best form of occupation therapy in fact. The night before the Derby a golden head came round the door about 3 A.M. and addressed my special (who was considered something of an authority on form) in a rich Cork accent. "Murphy, what's the name of the horse that goes best on soft ground?" "Harkaway, silly, but why bother now?" "Ah! don't ye hear the rain on the roof? I'll put five bob on after breakfast." Next day all the nurses not actively engaged gathered round my portable set (then rather a rarity) to listen to the race. The lucky night nurse came in her dressing-gown, having been specially wakened by permission of matron. We were well down the course when the familiar ping of a bell cut across the mounting crescendo of the announcer's narrative. "That's my no. 8: she would want a bedpan just as they're rounding the Corner—that ould wan," groaned the victim as she vanished down the corridor. She returned to a joyous party, for the winner had carried the Cork sportswoman's 5s. on his back to victory at 8 to 1, and night nurse didn't mind her draw being back among the also-rans, for she had sold her ticket to a syndicate for a pretty sum. Now she could buy that half-share in a friend's nursing-home which she had been coveting for years.

We all basked in the reflected warmth of her good fortune and I lay wishing that more of these sweet-natured, hard-working girls could get out of their rather dreary rut. Unless they were young and pretty enough to attract boy-friends from few candidates they had little social life to recompense them for the unselfish thoughtfulness and skill to which I for one owed so much. Has Rushcliffe changed all that? One hopes so.

* * *

A recent convalescence in a hospital side-ward confirmed the impressions of your not-so-peripatetic correspondent of May about the waste of nurses' and maids' time and strength on unnecessary labour. Until I lay beside an open fire for three weeks I had no idea how much of the staff's time—as well as fuel—was consumed by these anachronisms; and usually hospitals have many open fires. The thick sorbo-rubber mattresses, on the other hand, save so much effort in bed-making that no hospital should have anything else. Will it ever be possible to arrange a swing-round hand-basin so that bed-fast patients can wash themselves without having basins brought round? That would save hours of labour.

The chief impression that remains is, however, that of the complete unimportance—to the patient—of the size of the hospital. Confined to sick-bed, one's orbit is so limited that the immediate surroundings are the only things that matter and one neither knows nor cares whether there are 8, or 80, or 800 other patients under the same roof. I have never been more uncomfortable or more callously and discourteously treated than in a small cottage hospital (whose matron incidentally was the pet of the "county" ladies on the committee) and never have I found more home-like friendliness than in a great hospital of nearly a thousand patients. The secret of the whole thing is still the ward sister; she sets the tone and makes a "happy ship"—or the reverse. Old Mrs. Scharlieb, the pioneer woman doctor, once described her ward sister to me as "like a gracious hostess by whom everyone who came into the ward, from consultant to the patient's friend, was regarded as an honoured guest." So long as that tradition remains the patient will trust and respect the hospital.

* * *

The latest *March of Time* film is intended as an introduction to child psychology, but the remarks of the professional cinema critics are an interesting demonstration of adult psychology. The women critics with children of their own have on the whole roundly condemned it as unreal and unduly sentimental. They, with practical experience of infants and small children, find little that is wonderful in the mewlings and pukings of the infant, no matter how skilful the photography and direction. On the other hand the male critics, who have been spared the practical experience on which the women's comments are based, are much more enthusiastic. I must own that, though male, I found it hard to take the film seriously. Child psychology is undoubtedly an important subject, but "popular" treatment like this makes it seem very "phoney." Too much simplification is needed to keep within the time and scope of a short documentary film.

* * *

We were discussing the various theories of the causes of the onset of labour and we left the rails when I foolishly quoted the psychoanalytical theory—that it is brought about by the development of claustrophobia in the child. My friend denied this forthwith. He said it was much more simple than that; the child felt wet so it came outside to get dry. I pointed out that the little fellow had had a damp existence for some 280 days already and why should he suddenly decide that he had had enough? This he related to the comparative lateness of the myelination of the fibres subserving cutaneous sensation. It is only on the 281st day that the child acquires the wherewithal to feel wet. Being no anatomist, I conceded this. He gave me no respite but pursued his point, observing that the poor wee chap had to do in a matter of minutes what has taken a whole string of amœbæ, lungfishes, platypuses, and many assorted mammals several millions of years, namely, to get from wet water to dry land. He is quite content as a rule, after it is all over, to lie and wonder what to do next. Usually his mind is made up for him by some fool of a nurse who pops him into a bath and thereby sets him back almost to scratch. Not wishing to go through all that performance again, he objects and bawls. This theory also accounts for the orations of the infant on the subject of wet nappies, and for the small boy's hydrophobia; this latter particularly relates to behind the ears as it is this region which is most exposed to moisture by the intrauterine flexion. Hence also bathing, going for long walks in the rain, cross-Channel swimming, these are all signs of regression: and cremation the climax of independence. Remarking finally that amniotic fluid is non-alcoholic, my friend stopped for breath and whisky.

* * *

The queueing habit seems to be getting ingrained in all sections of our population. Where once we advanced in line abreast or in no formation at all, now we form up dismally, mechanically, and inevitably in single file. The students working for the diploma in tropical medicine and hygiene are faced in the laboratory with a number of individual specimens and a couple of dozen microscopes on the demonstration bench. Before the war the students worked in their own places most of the time, and looked at such demonstrations as were free when this was convenient. The post-war student has a different technique; the whole class queues up meekly behind the first person who reaches the demonstration bench, and passes slowly along the row of exhibits in an orderly line, although it means that many have to waste quite a long time before reaching the first microscope.

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Parliament

IN COMMITTEE

On May 29 clause 9, which deals with supplementary provisions relating to the transfer of hospital property and liabilities, was passed after Mr. C. W. KEY had added a new subsection.

Clause 10, which deals with the power to acquire hospital equipment, was also ordered to stand part of the Bill.

DETERMINING THE REGIONS

On clause 11 Mr. H. WILLINK moved an amendment to compel the Minister to consult the central council before constituting by order the regional hospital boards "for such areas as he may determine." Mr. Willink expressed his regret that Mr. Bevan was unable to be present, for he felt that the amendment offered a convenient opportunity for a discussion of the Minister's proposals for the boards. The wording of the Bill, he continued, left him uncertain whether the determination of the areas would be included in the order or whether the Minister would determine the areas on his own, and then by order set up a board for a predetermined area. We had no indication of what was in the Minister's mind and Mr. Willink thought it would be only decent for the Minister to undertake to consult the central council on this vital matter. Mr. KEY said that the orders setting up the regional boards would have to specify the areas for which they were being constituted. That would be necessary, because from time to time these regions would have to be altered in the light of experience. In setting up the boards there were two or three different aspects of the problem. First of all the delimitation of the area, secondly, the constitution of the board, and thirdly, the selection of the persons to be appointed to the board. The last two were not matters for consultation between the Minister and the central council, but it would be absolutely necessary for the Minister to consult his council on the first. It would, however, be dangerous to insert the amendment in the Bill, because if the things on which consultation was to take place were specified it might have the effect of excluding other things. He could assure the committee that in the first lay-out consultations with the central council would take place, although not upon the details of the constitution of the boards or their membership. The amendment was negatived.

Mr. RICHARD LAW moved an amendment that the boards should be set up and the regions defined by regulation instead of by order to ensure that the scheme would have to be submitted to Parliament. Mr. H. LINSTEAD said the regions were the shape of things to come. As the possible health areas or local-government areas of the future, they should not be left to unfettered departmental decisions but be subject to parliamentary review.

Mr. KEY insisted that the delimitation of these regional areas was an administrative function of the Minister, who should decide on the basis of information available in the hospital surveys. He should do it after consultation with statutory and other bodies and individuals whose knowledge would be of assistance. The amendment was withdrawn.

Mr. F. MESSER moved an amendment ensuring that the determination of the regions was included in the order. There was, he pointed out, no provision in the Bill as drafted for consultation with the local authorities. The Bill set up a triangular service—the general practitioner, the local health authority, and the hospital under the regional board. The service, he said, would not work unless the cogs in the machine all fitted. If a region was so determined that it cut through more than one local health authority, that would mean that the local authority had to consult more than one region; it might be that it would have to consult several. He agreed that it was an administrative matter so far as the Minister's service was concerned, but in view of the obligation on local authorities to do certain work there was a need that Parliament itself should have an opportunity to review the order.

Mr. KEY said he knew that he was interpreting the Minister's mind correctly when he said that he regarded this as an administrative function to be decided by the Minister administratively, and it was for him administratively to modify the areas if necessary. The Bill placed on the Minister the duty of providing the hospital service and consequently he must have powers to determine the areas. He had already given the assurance that he would only do that after consultation with the appropriate bodies—local authorities, medical practitioners, and hospital authorities. He was prepared to modify the clause so that the areas should be specified in the order constituting the original board.

Mr. WILLINK thought this insufficient and asked the committee to insist that there should be a proper and specific provision for discussion of the order in regard to the determination of the areas. Mr. MESSER said he felt that the Parliamentary Secretary would have to be bold if he gave any undertaking in the Minister's absence. Mr. Messer suggested that if Mr. Key would convey the discussion to the Minister he would be prepared to withdraw the amendment. But leave to withdraw was refused and on a division the amendment was negatived by 20 votes to 17, the narrowest majority which the Government have had on the committee stage of the Bill so far.

FUNCTION OF THE REGIONAL BOARDS

Resuming consideration of clause 11 on May 30 Mr. D. L. LIPSON moved an amendment with the purpose of clarifying the duties of the regional boards. The boards, he said, held a key position in the scheme, yet as the Bill was drafted there was great ambiguity about their functions. From what the Minister had said the management of the hospitals would be the task of the management committees and the function of the boards would be to see that the provision of the services required for carrying out the proposals for the National Health Service were satisfactory. The amendment would secure this. His aim was not to depreciate the status of the boards; but to emphasise it. Sir HAROLD WEBBE supported the amendment but for different reasons. The amendment would remove from the boards the responsibility for the administration of the hospitals, and throw it back to the authorities who now exercised it, thus removing the greatest objection to the major set-up of the scheme. When in 1930 local authorities became for the first time hospital authorities, Sir Harold continued, their preventive and curative services for the first time found a focus in the hospitals, which became not only research stations for the public-health services but courts before which those services were tried when they failed. It was impossible to overestimate the immense benefit to the health of the people which came from this interlocking of the preventive and curative medical services. A second point was that if the boards were to administer they would be faced in London with the sector organisation adopted during the war, and that would not work. There would be perhaps half a dozen hospital areas meeting in London, with the L.C.C. as one health authority responsible for all the domiciliary health services working outwards and upwards to a number of hospital authorities. Many experienced public-health administrators were of the opinion that the complete revolution in the machinery of management of hospitals proposed must lead to something approaching administrative chaos, and for years stop any large-scale development of the hospital services. It was clever of the Minister to use the well-known reluctance of the medical profession to have anything to do with the local authorities, and for that reason he admitted the administration of the voluntary hospitals would have to be dealt with differently. He was merely asking now that the planning should be done centrally by the Minister and the regions, but that the administration of the hospitals, particularly of those which ought to be associated with the public-health services, should be left with the public-health authorities.

Mr. KEY pointed out that, as Sir Harold Webbe's support showed, the amendment would break up the whole of the administrative scheme of the Bill. They were establishing not a local hospital service but a national hospital service, the responsibility for which was placed on the Minister who must have his agents to carry out the duty. The Bill proposed that the Minister

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should work through regional boards and that they should work through hospital management committees. The efficiency of that administrative scheme would be vitiated if the boards became mere planning and supervising authorities without responsibility for administration. Planning and coördination certainly fell within the administrative functions of the boards, and the Minister had made it plain that he would get them into existence as soon as possible for purposes of consultation. Hospital management committees would not be responsible for a given local-authority area; they would manage an institution, or group of institutions, related functionally and not merely geographically. Local autonomy was not the conception of the scheme, but responsibility delegated downwards from the Minister. The amendment would leave the boards without any administrative functions, and it was on the importance of those functions that the Government must insist.

Mr. WILLINK said that the Minister had been persuaded to review the responsibilities of the management committees, and if the functions of the committees were increasing the functions of the boards must be decreasing. He thought the Minister intended that the boards should compulsorily delegate their administrative responsibility and retain supervision. Mr. LINSTEAD also thought that the conception of the service was taking a new shape as the debates developed. The centre of gravity was shifting more and more to the hospital management committees. By all means let them be guided in the appointment of their senior staff by specialised selection committees at regional level, but leave them the greatest possible freedom in the day-to-day running of their own hospitals. Nurses were peculiarly jealous that they were members of the staff of a particular hospital. At present they were apprehensive that they were to become members of the staff of a region, in which they could be moved about.

Mr. KEY said that the function of the regional boards was to administer the hospital and specialist services. The function of the hospital management committees was to administer the detailed day-to-day business of the hospital or group of hospitals for which they were responsible. That was the distinction in administration and the two could not be divorced. If the board was cut from the chain of responsibility between the Minister and the hospital management committee we should not have an efficient stream of administration. There had been no change in the conception of the scheme of administration, with the possible exception that the hospital management committees might be allowed to hold money and endowments and accept gifts. Appointment, selection, and dismissal of the ordinary staff of hospitals would remain with the hospital management committees, and they would maintain and supply their hospitals. The regional boards were to be the agents of the Minister; the hospital management committees the agents of the boards. As far as possible detailed responsibilities would be pushed on to the lower bodies to give them real scope for doing their work. The main functions of the committees would be prescribed by regulations though it would be possible for the boards to give them other directions. The amendment was negatived.

LOCAL AUTHORITIES AND THE REGIONS

Mr. MESSER moved an amendment providing that the Minister, before making any order determining the regions, should consult the local authorities and other organisations. It was important, he held, that the preventive services which would be the responsibility of the local health authority should be closely linked with the hospital service. If the regions were drawn so as to hamper the preventive service that would not be to the advantage of the health service as a whole. Mr. KEY said he had a great deal of sympathy with what Mr. Messer had said. The Government agreed that there ought to be these consultations and he wished to see a reference to them in the Bill, but he could not undertake that they should be limited to local authorities or that the interests to be consulted should be specified. The amendment was by leave withdrawn.

AREAS OF HOSPITAL MANAGEMENT COMMITTEES

Commander J. F. MAITLAND moved an amendment with the object of relating the number of beds controlled by a hospital management committee to the size and geography of the area. The Minister had said on May 23 that in rural areas the committee might spread over quite an area to accomplish a 1000-bed unit. He hoped the Minister would not tie himself to that unit for rural areas. Dr. STEPHEN TAYLOR opposed the amendment because it favoured the small unit of hospital administration. For an efficient service the number of cases of a particular kind in the area should be adequate to maintain specialists. The danger of small units was that seen in small hospitals where general practitioners performed specialist work. The abuse had grown up in some cottage hospitals of bogus lists of consultants who did not attend. Whatever area a committee covered it should be such that its hospitals can retain specialists. Mr. WILLINK suggested that as the specialist of a region could be attached to several hospital management committees it was the region which must be large. But Dr. TAYLOR disagreed, saying that the unit of hospital administration must be a hospital unit and not a geographical one. Mr. WILLINK urged that if the Bill was to be safeguarded from one of its greatest dangers—the absence of tie-up between clinic and hospital service—the Minister should look favourably upon a geographical county as being the appropriate area for a hospital management committee. Mr. KEY denied that there was any intention of being hidebound by the idea of 1000 beds, 800 beds, or 1200 beds. Other things would have to be taken into account. He could not accept the suggestion that all the committee's hospitals must be within the area of the same local health authority. There must be geographical and numerical flexibility.

OTHER POINTS

In summing up the debate on clause 11, Mr. KEY said that the designation of new teaching hospitals was a matter for the universities and not for the central advisory council. But if it was felt that the advice of the central council would be helpful no doubt the Minister would seek it. It was the intention of the Minister that there should be a standing advisory committee on hospital services. Consideration was being given to the future of tuberculosis allowances which must be outside the general scheme of the Bill. He could give no undertaking what link there would be between region and region. The clause as amended was ordered to stand part of the Bill.

On clause 12 Mr. KEY moved an amendment making it clear that the Minister was not required to carry out his duties in providing the hospital and specialist services exclusively through the regional hospital boards, but might provide some services direct. New services might grow up which would need a national area for their development. As an example he cited the blood-transfusion service, which was developed under central control during the war, and which it was intended to continue to organise on that basis.

DIRECTIONS

Mr. RICHARD LAW moved an amendment which raised again the question of what he described as the arbitrary powers of the Minister under the Bill to make regulations which were not subject to the control of Parliament. The Minister, he said, could reasonably claim that he must have freedom of action, but the use of that freedom should be subject to the approval in one form or another of Parliament. Mr. KEY said the regional hospital boards and hospital management committees must be guided and directed in their work by regulations. Parliament could always challenge the Minister for making such regulations.

Mr. H. STRAUSS believed that in the Bill there was no separation between what could be dealt with by regulation and what by direction. Nothing in the Bill excited more suspicion and hostility than its constant repetition of the power to act by direction. The amendment was negatived.

Mr. A. H. E. MOLSON asked the Secretary of State for Foreign Affairs how much food had been sent by UNRRA to the U.S.S.R.—Mr. H. MCNEIL replied: I am informed that up to March 31 last, UNRRA had shipped approximately 130,000 tons of food to the Ukraine and Byelorussia, which are the only two Soviet republics in receipt of UNRRA assistance.

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FROM THE PRESS GALLERY

Daily Bread

The food resources of the world were discussed in the House of Lords on May 30 and the House of Commons on May 31.

In the Lords, Lord LLEWELLIN moved, "That in the opinion of this House it is essential that the standard of feeding of the people of this country should not be further reduced, but on the contrary should be improved as speedily as possible." Lord AMMON, replying for the Government, accepted the motion on the clear understanding that it expressed the view of the House as to the desirability of maintaining and improving the standard of feeding of the people of this country and that it did not in any way convey the understanding that there would be no further restrictions or limitations of our present food-supplies. In face of the world food situation that was an undertaking which no Government could possibly give. We had to bear in mind that we carried a large measure of the responsibility for the procurement of food for people outside this island—for countries in our Empire and Commonwealth, such as India and South East Asia, and for the population in our zone of Germany who were subsisting on rations far lower than our own. Weary though we were of austerity, we could not ignore those responsibilities. There was not so much complaint of the quantity or quality of our food as of its dullness, and the Government hoped to relieve that dullness a little. They were prepared to take even more drastic measures to eke out our bread supplies. So far as Germany was concerned, if we failed to maintain even the present meagre level of rations we should be turning the Ruhr into another Belsen. Not only were we morally bound to keep these Germans fed; there was also the legal obligation resting on us under international law. We should all be glad to see the end of austerity, but if in face of world famine we had to continue to endure some measure of austerity for a period, or even to face some added hardship, we could console ourselves with the knowledge that as a nation we had not suffered physical damage from our privations, and could indeed endure worse without disaster.

Speaking in the Commons, Mr. H. MORRISON said the difficult business of dealing with our own claims and the recognition of the claims of the hungry peoples tugged at the hearts of the Government. They were torn between the instinct of "Let's look after ourselves" and the right human feeling that they had to do everything, including sacrifices, to prevent the spread of famine in the world and the consequences of it. Before his visit to Washington, Britain, the most dependent of all countries on food imports, was in process of being saddled with the responsibility of feeding 20 million hungry Germans and 400 million hungry Indians. That was a responsibility which the world as a whole must share. Since the German civilian programme began last autumn we had sent to the British zone out of United Kingdom stocks: flour, 88,000 tons; shipped barley, 60,000 tons; barley to be shipped, 70,000 tons—a total of 218,000 tons. We had arranged diversions to Germany of the following British cargoes afloat: wheat, 255,700 tons; flour, 6000 tons; oats, 3500 tons; barley, 7300 tons—a further total of 272,500 tons, or a grand total of 490,500 tons. There had also been diversions to India. Out of United Kingdom stocks 4000 tons of flour had gone to India, as well as 100,000 tons of wheat, making a total of 104,000 tons. The Washington agreement, Mr. Morrison continued, had brought to an end the impossible position with which our representatives in the British zone in Germany had been faced. Stocks on hand and in sight in the British zone at the time he left London were so low that by today there would not have been a ton of bread grains left in British-occupied Germany. In such conditions we could not have maintained our share in the occupation, which would have fallen to pieces. There was also good reason to believe that a threat of a breakdown in India had been averted.

Mr. JOHN STRACHEY, Minister of Food, speaking later, said that the Government had decided to authorise his department to proceed at once with full preparation and full consultation on a scheme of bread and flour rationing. Perhaps about the end of June, the decision would be taken whether the scheme should be put into operation. If there was the slightest risk of shortage of fundamental foodstuffs in this country the decision would be to ration. If rationing came it should be taken as a security measure.

QUESTION TIME

Scientific Man-power

Mr. PHILIPS PRICE asked the Lord President of the Council whether he had yet received the report of the committee which he appointed last December to consider the use of the nation's scientific man-power and resources during the next ten years.—Mr. HERBERT MORRISON replied: The committee have reported, and their report makes a strong case for a very substantial expansion in the output of qualified scientists from the universities at the earliest possible date. The Government are in general agreement with their conclusions, which we recognise will involve a substantial liability on the Exchequer. We hope that they will receive the immediate and serious consideration of the university authorities, so that detailed proposals for giving effect to them can be formulated in consultation with the University Grants Committee.

Reabling the ex-Miner

Mr. D. J. WILLIAMS asked the Minister of Labour how many ex-miners suffering from pneumoconiosis in South Wales had applied for admission to training centres; how many had been accepted; and how many had commenced training.—Mr. GEORGE ISAACS replied: 516 ex-miners suffering from pneumoconiosis have applied for training in South Wales since January, 1942; 56 later withdrew their applications; 441 of the remaining 460 were accepted; and 242 have so far commenced training.

Release of R.A.F. Medical Officers

Sir ERNEST GRAHAM-LITTLE asked the Under-Secretary of State for Air, having regard to the fact that medical officers in the R.A.F. would, by July, still be about 10 groups behind the R.N. as regarded their release and that the matter had now been under consideration for six months, when he expected the release groups to become approximately equal in the three Services.—Mr. G. DE FREITAS replied: The release of medical officers in the Royal Air Force is slower than in the other two Services because the war-time proportion of medical officers in the Royal Air Force has been much lower than in the Army or the Navy. We are, however, doing all we can to increase the intake in order to reduce the differences, but I am afraid that I cannot forecast at this stage when approximate equality between the three Services will be reached.

Shortage of Nurses

Mr. C. OSBORNE asked the Minister of Health if he was aware that the medical superintendent of the county infirmary, Louth, was unable to take further responsibility for the proper treatment of patients because the hospital was understaffed; that a petition had been signed by all the sisters against the long hours they were having to work and there was a danger of admissions having to be restricted; and what could he do immediately to relieve the position.—Mr. C. KEY replied: The Minister knows this hospital is understaffed and it has been necessary to close 40 beds. The main need is for more trained nurses, and with the Minister of Labour and National Service he is doing everything he can to help; but there is a shortage of nurses throughout the country.—Mr. OSBORNE: Is the Minister aware that many small county hospitals feel that they are not getting a fair share of the new nurses who are coming forward as compared with the large hospitals in the cities? Will he look after the interests of the smaller hospitals?—Mr. KEY: A recruiting campaign for student nurses covering the Louth area is about to be launched.

"... To adopt just what has been done recently for our soldiers and sailors as a regular procedure for the whole of our civilian population in the way of preventive medicine, or in the way of care when either disease or wounds are present, would bring the costs of medical care in the United States to fantastic amounts. With our present thinking, what is tolerated in war-time in preventive medicine would be almost impossible to put through in peace-time among the whole population. Public thinking, public understanding is still at the 'magic weed juice' level, if radio advertising is used as a measuring stick."

R. L. WILBUR. *J. Amer. med. Ass.* 1946, **130**, 1055.

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Letters to the Editor

RHEUMATIC DISEASES: A BRITISH LEGION UNIT

SIR,—May I, as chairman of the Empire Rheumatism Council, draw attention to an important development shortly to be undertaken by the British Legion?

The British Legion has, with the full support of the Ministry of Health, undertaken to finance and sponsor a unit of fifty beds exclusively for ex-Service personnel suffering from arthritis and/or rheumatism. "Ex-Service" is the only qualifying requirement; there is no differentiation made if the sufferer is not actually a member of the British Legion. All recommendations pass through the British Legion headquarters, and must have the support of the patient's own practitioner. It is obvious that if any advance of value is to come from this investigation the collaboration of the medical profession in the selection of suitable cases is essential.

Whilst there is no suggestion that at this new unit any method of diagnosis or treatment will be employed that cannot be obtained at any general hospital, the unit is, however, intending to concentrate on several factors which, when taken together, may prove a valuable approach to the treatment of these sufferers. First, the unit will operate in the country. Secondly, it is to be housed in buildings specially set aside for the Legion so that the spirit of the Legion may permeate the whole unit and help to foster recovery. Thirdly, it is to be run in close association with a teaching hospital, thereby securing the full availability of all branches of medicine concerned in the team work which the investigation and treatment of rheumatic cases involves. Lastly, no particular period is to be placed on the duration of stay, and, where advisable, it is expected to be possible to continue long-term treatment at one or other of the four or five convalescent hospitals which the Legion is now opening. A special feature of the unit will be the rehabilitation and training of patients for replacement in industry.

I venture to think that this experiment, as outlined, will prove a useful example for the initiation of other similar centres.

The Empire Rheumatism Council intends to watch this investigation with great interest. I may add that I have inspected the proposed site and buildings and have discussed the project with those immediately concerned. I believe the scheme to be full of promise.

HORDER.

Empire Rheumatism Council, Tavistock House North, Tavistock Square, London, W.C.1.

VENEREAL PHOBIA

SIR,—Though the widespread press-and-poster publicity may help to check the spread of venereal disease, it may also assist in producing a venereal neurosis in many men.

During the last eight months about 400 Servicemen returning to the United Kingdom have sought my advice because of frequency of micturition, sensations of burning in the penis, alleged discharges from the penis, alleged skin lesions of the penis, a feeling of heaviness of the testicles, dribbling after micturition, aching in the groins, sensations of discomfort in the perineum, or such rarer symptoms as a feeling of coldness of the penis, or feelings of dampness round the genitalia. Most men seen had been abroad over two years, and many as long as five years. In nearly all cases symptoms began immediately or a few days after sexual intercourse, which in over two-thirds of the cases was said to be the only occasion during their overseas service.

The man with a neurotic tendency for whom fornication is a rare event wakes next day with doubts about the possible outcome. His penis tingles and throbs, he squeezes it to see the feared discharge, and minutely examines it for signs of a sore; even a prominent capillary fills him with alarm. On micturition, especially if he has used calomel ointment prophylactically, he feels a burning sensation. He seeks every opportunity to urinate, so that he can examine his genitalia and reassure himself. Even while sitting at stool he cannot resist inspection of the site of anticipated disease. As the days pass, V.D. increasingly comes to his attention. At the back of pictorial magazines he carefully peruses the "Doctor's Diary" and counts the days until he himself is due to become a victim. The conversation of his friends about V.D. is a frequent jar to his nerves, and rumours of the admission of a man to hospital with suspected V.D. stab deeply into his troubled mind. His powers of concentration become increasingly impaired. In despair he goes to see his doctor, who may be busy and seems only to give him a cursory examination. Though told that there is nothing wrong, he goes away dissatisfied, feeling that his case has not been properly understood. Later he may persuade someone to do a blood test, but the agony of suspense while waiting for the result only fertilises the seeds of doubt already sown. A negative result often does not relieve his symptoms.

Venereologists are usually fully occupied with organic lesions and have little time to devote to cases with no signs of disease. Of the cases seen by me some had found their way to surgeons and undergone full or partial renal investigation. Though reassured, they subsequently consult every doctor they can, with increasing symptoms and anxiety.

I do not suggest that venereal phobias are anything new, but such cases are likely to be on the increase. Millions of men are returning from long periods of service overseas, and many who have set high ethical standards for themselves will have isolated sexual transgressions on their consciences. Already warned of the risks of V.D., they are arriving home to find a flood of propaganda emphasising how "it" may be concealed in the system. Patients who complain of urogenital symptoms should be interrogated about venereal worries. If there is no obvious organic basis, a few words about the cause of the symptoms may save a lot of unnecessary investigation. Explanation of how the symptoms arose usually leads to an expression of gratified relief—"that's just what it's been like with me."

The layman, from an attitude of careless abandon to V.D., seems to be swinging too much the other way. Perhaps he is getting unnecessary encouragement from the profession.

Kingswinford, Staffs. P. HADEN.

REVOLT FROM THE BEDPAN

SIR,—Your timely leader of June 1, prompted by the sufferings of Dr. Douglas McClean as described in his excellent letter, calls attention to a much-needed reform. The facilities for cleansing and sterilising bedpans and urinals in many of our hospitals are primitive, especially when contrasted with the sterilising equipment provided routinely for operating-theatres. The horrors of chipped enamel bedpans and urinals cannot be overstressed.

In a recent tour in Denmark with the Provincial Surgical Club we saw at the County Hospital, Roskilde, a piece of apparatus that would solve at least part of the bedpan problem. This was an armchair on wheels made of tubular steel. Instead of an ordinary seat it had a hinged lavatory seat. The patient was transferred from his bed to the chair, and then wheeled to the lavatory. The chair was of correct height to go over the lavatory pan. This obviates the emptying of bedpans or commodes. The steel chair also had hinged leg-pieces which could be raised if the patient's leg was in a splint or plaster.

Inverness. A. J. C. HAMILTON.

EPIDIDYMO-ORCHITIS

SIR,—In your issue of May 26, the excellent articles on non-specific epididymitis by Mr. R. S. Handley and on non-specific epididymo-orchitis by my erstwhile colleagues, Brigadier R. E. Tunbridge and Lieut.-Colonel C. J. Gavey, both wisely leave the ætiology unsettled.

I have seen sporadic cases following dysentery, and I would suggest bacillary dysentery as a possible cause of the conditions, which probably have a mixed ætiology.

The cases of epididymo-orchitis reported in Tunbridge and Gavey's paper occurred between May and September, which is the bacillary dysentery season. Moreover, no less than 11 of the 30 patients had abdominal symptoms—i.e., 1 amœbic dysentery, 2 pain in the right iliac fossa, 5 pain in the left iliac fossa, 2 diarrhœa, and 1 pain in the abdomen.

Mr. Handley states that non-specific epididymitis is usually due to prostatitis and vesiculitis following a non-specific urethritis. Manson-Bahr, in his *Tropical Diseases* (12th ed.), gives non-specific urethritis as a complication of bacillary dysentery. This I have seen myself in several patients.

London, N.W.8. EDWARD GEAL.

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FOWLER'S POSITION

SIR,—Mr. Layton girds on his armour and clanks into battle without caring whether the lady he sets out to rescue is a maid in the clutches of an ogre or a witch dying from natural causes.

He says that the Fowler position attacked by Spalding and me is a "bastard" Fowler. On the contrary we attack the genuine Fowler, with its immobility, and look on the bastard variety as, by comparison, harmless. It is the hourly struggle between nurse and patient that mitigates its worst dangers: it is the abolition of exertion that renders it so fatal.

Mr. Layton claims that the Fowler position is excellent for the treatment of respiratory infections. With this statement I would not attempt to disagree: but when he asks whether embolism has been recorded after the Fowler position without the abdomen being opened, I would remind him that cases of fatal pulmonary embolism from the medical wards far outnumber those from the surgical departments. Abdominal section is contributory, not because it damages veins but because it slows the venous pump, and thrombophlebitis starts, not in the veins of the pelvis but in those of the calf.

Lastly, Mr. Layton reminds us that Lane and other great men advocated it. We must not use great names (to quote a wag) as the drunkard uses lamp-posts, for support rather than for illumination. Lane was a pioneer, ready to adopt good work wherever he found it. He accepted Fowler's views in 1906: he would have been the first to accept Spalding's exposure of their unsoundness in 1946.

Lives of great men should remind us
We can make our lives sublime
Only when we leave behind us
Crazes that have had their time.

London, W.1. HENEAGE OGILVIE.

PHOTOMETRIC MEASUREMENT OF BACTERIAL GROWTH

SIR,—Your annotation of May 11 directs attention to a topic which is assuming increasing importance to workers in widely divergent spheres of activity. Apart from their medical aspects, the problems inherent in the estimation of the relative numbers present in bacterial populations have both scientific interest and industrial applications.

It was stated in your annotation that a serious limitation to the usefulness of photometric methods was imposed by their insensitivity to the lower bacterial densities. This disadvantage can, however, be overcome by the use of the principle referred to in a recent communication to *Nature*.[1] The apparatus there briefly described is capable of a considerably higher sensitivity than systems based on measurement of the reduction in transmitted light.

Measurements are made of the degree of scattering which takes place when a parallel beam of light is passed through the culture medium under examination. In contrast to the transmission methods, this method gives progressively increasing readings with the development of the bacterial population. Apart from its considerably greater sensitivity (which can be adjusted very simply to cover an appreciable range), the new method possesses the additional merit that photocell fatigue is not so likely to occur and even if it does it cannot be mistaken for the initial stages of bacterial growth. This is in contrast with the transmission methods where the onset of fatigue produces a result identical with that given by a small increase in the bacterial population.

In view of the variation which can be made in the sensitivity of an apparatus employing the light-scatter principle, it is not possible to give figures for its maximum sensitivity, but no difficulty has been experienced in detecting the growth resulting from 5 hours' incubation of an inoculum equivalent to the addition of 1 ml. of a 24-hour culture of *Bact. typhosum* to 100 litres of broth. Using the same sensitivity adjustments and a 5-hour incubation-period, full-scale deflection can be obtained with an inoculum equivalent to 1 ml. of a 24-hour culture of *Bact. typhosum* in approximately 4 litres of broth. Results of a similar order have been attained with cultures of *Staph. aureus*.

1. Needham, N. V. *Nature, Lond.* March 23, 1946, p. 374.

The figures you give for the accuracy of photometric methods (± 1 to 3%) could probably be improved, but even this degree of accuracy compares favourably with that normally attributed to the alternative methods mentioned—hæmocytometer counts and plating. Wilson et al.,[2] in a comprehensive examination of this question, give the accuracy of plating methods, as applied to milk analyses, as ± 90% for a single plate, the corresponding figure for plates in triplicate being ± 52%. There is so much in common between the probable sources of error in plating and hæmocytometer counts—i.e., counting difficulties, measurement of small amounts, inaccuracy in the pipettes, and variable numbers of bacteria adhering to the internal surfaces of the pipettes—that it seems reasonable to assume that, unless very stringent precautions are taken, the error of a single hæmocytometer count will approximate to those mentioned for plating.

From the standpoint of the time required to carry out a determination, the photoelectric methods are unquestionably superior, it being possible to exceed your figure of 20 cultures per hour by a wide margin.

N. V. NEEDHAM.

Cooper Technical Bureau, Berkhamsted.

DRUGS AND THE NATIONAL HEALTH SERVICE

SIR,—The high cost of new drugs and apparatus is defended by the manufacturers as a necessary part of research costs. Before the war the Government provided a limited sort of protection to the public against unfair or prohibitive prices for a few very important drugs like insulin; but the early costs of the more effective sulphonamides were only to be met, for working people, through the hospitals; and for several years one of the most effective, sulphadiazine, was sold at a price which made the research which had gone to produce it benefit only the well-to-do. Now folic acid, which (if claims are justified) will replace liver injections in the treatment of pernicious anæmia and sprue, and which will cure certain hitherto refractory anæmias, is to be marketed at 3*s.* a tablet, the effective daily dose being about four tablets.

During the war, Fleming's discovery of penicillin as a remedy was exploited exclusively by the Government for the people as a whole and was supplied free—i.e., the whole cost fell on taxation. It is now to be sold at a controlled but not negligible price.

You will agree that the National Health Service must not run the risk of incurring the criticism levelled at panel practice, of limiting the cost of drugs and apparatus prescribed, and surcharging the "extravagant" doctor. But neither must it be possible for fortunes to be made out of drugs at the public expense. I believe that the advantages accruing from the commercial exploitation of pharmacy and instrument manufacture, in the direction of independent research and cheapness of manufacture, are all outweighed by permitting the advertisement of doubtful, inferior, or unproved remedies. The solution of this problem, as has been magnificently demonstrated in the case of penicillin, is the endowment of research laboratories in the universities and in association with a nationalised drug industry, experimental work being encouraged in the health service whenever conditions allow of reliable results. The field of commercial "private enterprise" should be limited to cosmetics and the simpler kinds of home remedies.

Inverness. D. G. LEYS.

SHORTAGE OF NURSES

SIR,—Prof. J. W. McNee draws an alluring picture of a cadet corps of nursing candidates crossing a modern "bridge" to hospital portals beyond. Parental eyes will however peer further into the future, seeking to know what then awaits their treasured young. Will it be a remodelled service comparable with other trainings? Or will it still be the indefensible double life of a full-time employee who must also study for a professional status?

Professor McNee shows himself the imaginative planner; so one hopes he has joined the ranks of those who seek to recast the conditions of the nurse's hospital life.

Moor Park, Middlesex. ESTHER CARLING.

2. Wilson, G. S., Twigg, G. S., Wright, R. C., Hendry, C. B., Powell, M. C., Maier, I. *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 206, 1935.

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THE G.M.C. ELECTION

SIR,—In reply to the General Medical Council's request in your issue of June 1, headed "Correction of Medical Register," I wrote on that date to say I had not received a voting paper. On the evening of June 3 I received one, which had to be returned completed by the 5th. I was fortunate in being able to act promptly in both cases, but many colleagues may not have seen the request in time for the normal postal services to deliver their votes by the prescribed date. In an election so long postponed because of the war, could not a little more time have been allowed both for ascertaining the policies of the candidates and for recording the votes?

London. G. B.

THE ANÆSTHESIA FILMS

SIR,—The cost of the series of films on anæsthesia made for I.C.I. will be much nearer £50,000 than the £15,000 you mention in your annotation of May 25. This larger figure lends weight to the contention that films of this type will always need to be sponsored either by philanthropic institutions or by industry. It is unlikely that either the medical profession or medical schools will be able to find the money to finance such enterprises.

The possibility of producing a book based on the series is under consideration.

Imperial Chemical Industries Ltd. SIDNEY ROGERSON.

THREADWORMS

SIR,—I must point out some errors in your leading article of May 18 (p. 742) where you describe our method of detecting enterobius. According to your description the pestle is used after preparation of the perianal skin with the massaging finger, but that was not our intention. Either finger or pestle should be used—not both—the latter being particularly suited to mass research and the former to the single case. The pestle takes the place of the finger, so its diameter is about that of the tip of the finger—i.e., 1·75 cm. or $^2/_3$ inch, *not* $1^3/_4$ inches.

The method consists of two parts: (1) preparation of the material on the perianal skin; and (2) collection of the material and transference of it to the slide. For (2) a scraper is the best instrument, but a finger or the pestle is satisfactory for the purpose.

The drying of the material on the slide is an essential part of the technique. Transport is then easy, and the slides are ready for examination with cedar-wood oil, *never* NaOH.

Hilversum, Holland. W. SCHÜFFNER.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MAY 25

Notifications.—Infectious disease: smallpox, 8 (2 at Birkenhead, 6 imported cases at Liverpool); scarlet fever, 1089; whooping-cough, 2075; diphtheria, 371; paratyphoid, 0; typhoid, 8; measles (excluding rubella), 3287; pneumonia (primary or influenzal), 557; cerebro-spinal fever, 67; poliomyelitis, 9; polio-encephalitis, 0; encephalitis lethargica, 5; dysentery, 200; puerperal pyrexia, 151; ophthalmia neonatorum, 75. One case of typhus was notified at Grimsby.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on May 22 was 1059. During the previous week the following cases were admitted: scarlet fever, 46; diphtheria, 36; measles, 119; whooping-cough, 25.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (0) from an enteric fever, 1 (0) from measles, 15 (4) from whooping-cough, 7 (1) from diphtheria, 52 (5) from diarrhœa and enteritis under two years, and 7 (1) from influenza.

Birkenhead reported 1 death from an enteric fever. There were 11 fatal cases of diarrhœa and enteritis at Liverpool.

The number of stillbirths notified during the week was 249 (corresponding to a rate of 27 per thousand total births), including 35 in London.

THE annual competition of the Manchester and District Medical Golfers' Association will be resumed this year at Torkington on Wednesday, June 26. Mr. R. L. Newell, F.R.C.S., is captain of the club, and further information may be had from the hon. secretaries, c/o British Medical Bureau, 33, Cross Street, Manchester, 2.

Obituary

JOHN OLIVER WENTWORTH BLAND

M.D. CAMB.

J. O. W. Bland was a distinguished microbiologist who received his early training at Cambridge and St. George's Hospital. After qualifying and holding house-appointments, he returned to Cambridge and worked for a time in the department of pathology and the Strangeways Laboratory, where he acquired that grounding in the technique of tissue cultivation which was to prove of such value to him in his later researches. In 1927 he joined the Freedom research department of the London Hospital where, in collaboration with Prof. S. P. Bedson, he did valuable original work on the viruses of psittacosis, herpes, and vaccinia. It was in connexion with his study of the first of these viruses that Bland's technical ingenuity was best displayed. He was able to follow the development of psittacosis virus while growing in cells, thus confirming the evidence obtained from fixed stain preparations that this virus passed through a cycle of developmental change when multiplying, and he was able with the collaboration of Dr. R. G. Canti of St. Bartholomew's Hospital to make a unique cine-photomicrographic record of this work.

After some nine years at the London Hospital, Bland went to St. Bartholomew's Hospital as an assistant bacteriologist. This post was not held for long. His work there was seriously interrupted by illness, but he had time with Dr. Robinow to make a study of the multiplication of vaccinia virus in tissue culture, from which evidence was obtained suggesting some sort of developmental cycle.

Shortly before the war Bland took a post abroad with the Egyptian government at the Giza Ophthalmic Research Laboratory, Cairo. Here his energies were directed mainly to the study of trachoma, and although this work was interrupted to a considerable extent by the war he achieved material progress. Trachoma virus is by no means easy to study, because of the lack of a good experimental animal, but Bland was able to transmit the infection to monkeys and from them back to human volunteers. His findings showed that although baboons and grivet monkeys were both susceptible to trachoma, the tendency for both to develop spontaneous folliculosis of the conjunctiva rendered them unsuitable for trachoma work. His presence in Egypt was greatly appreciated by pathologists of the R.A.M.C., who frequently sought his valued advice on virus problems affecting the Army. Both Bland and his wife, who survives him, were keen musicians, and their home in Cairo offered an ever-open door to many a young British soldier sorely in need of good company and entertainment.

In 1944 ill health compelled him to abandon this work and after a period in hospital in Palestine he came back to this country to continue treatment in the Osler Sanatorium at Oxford. Leaving hospital early in 1945, he continued his convalescence at his cottage in Sussex, and by the middle of that year he seemed sufficiently restored to health to start work again. He joined the staff of the pathological laboratory of the Royal West Sussex Hospital at Chichester with the object of becoming fully acquainted with modern routine clinical pathology and so eventually of taking a permanent post in this branch of pathology. But his health did not allow him to follow this course for long, and he retired once more to his country home. He became acutely worse and died in St. Bartholomew's Hospital on May 10. His loss will be felt by many, who will cherish the memory of this gentle, kindly, and unassuming personality.

JOHN MATTHEWS

M.B. CAMB.

John Matthews, who died at 20, Wimpole Street on May 25, was born at Newton-by-Castleacre, in Norfolk, in 1872. Before he settled down to a medical career he was at a nautical training college, H.M.S. *Worcester*, and he spent two years at sea. Then he entered St. John's College, Cambridge, and after taking an honours degree he finished his medical studies at St. Mary's Hospital, where he was a fellow student of Wilfred Harris and V. Warren Low. After qualifying in 1900 he filled the usual appointments at St. Mary's. Later he went to

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Egypt as civil surgeon in the Army of Occupation when he was examiner in medicine and pharmacy in the medical school of Cairo.

He returned to England in 1906 and entered Almroth Wright's laboratory at St. Mary's, where he remained for the rest of his life. When he joined Wright's laboratory, vaccine therapy controlled by the opsonic index was almost in its infancy and he was one of the team consisting of Wright, Douglas, Freeman, Colebrook, Wells (who died of glanders), and Fleming. He was always a hard worker and soon became one of the most important vaccine therapists in London. In spite of running an extensive practice he found time for research work and he published a number of articles in the scientific journals and was one of the authors of the *Oxford Practice of Medicine*. Perhaps the piece of work most pleasing to him was the introduction of a digested blood medium for the growth of Pfeiffer's bacillus which was the precursor of chocolate agar and Fildes medium.

But he had many interests outside of medicine. He was a very keen and prominent Freemason, and in addition to other honours was a past grand deacon of the United Grand Lodge of England, and a past grand sojourner of the Grand Chapter, and he reached the 32nd degree in the Rose Croix. He took a prominent part in founding the Lady Margaret Lodge for old students of St. John's College. Before the war he was a keen fisherman and nothing pleased him more than having a day on the Test. He enjoyed life, and like his great friend Warren Low he was a fine judge of a good wine.

John Matthews had many friends and for them he was always putting himself out to do kindly acts. There was no-one more beloved by his patients and his colleagues, and his loss will long be felt. A. F.

WILLIAM McADAM ECCLES

M.S. LOND., F.R.C.S.

Mr. McAdam Eccles, consulting surgeon to St. Bartholomew's Hospital, died on May 30, at the age of 79, in the hospital which he had loved and served for sixty years. His last task was to organise the commemoration celebrations of its 400th anniversary.

The son of Dr. W. Soltau Eccles, of Norwood, he was educated at University College School and received his medical training at University College Hospital and St. Bartholomew's. As a student he had a distinguished career, taking his M.B. in 1890 with honours in forensic medicine and obstetrics, passing the final F.R.C.S. two years later, and securing the M.S. with gold medal in 1894. In 1900 he was awarded the Jacksonian prize of the Royal College of Surgeons for his essay on Diseases Caused by the Imperfect Descent of the Testicle. Early in his career he became assistant surgeon to the City of London Truss Society, where he was associated with John Langton and Macready in the days when trusses were more important than operations in the treatment of hernia, and his book on *Hernia* quickly went to three editions. He also joined the staff of the West London Hospital, where he worked with Stephen Paget and C. B. Keetley, and he always retained an affection for this hospital, later becoming president of the West London Medico-Chirurgical Society. But when in 1903 he was appointed assistant surgeon to St. Bartholomew's Hospital he resigned to devote himself to the senior hospital, where he held many appointments. In the medical school he was a lecturer on surgery and on clinical applied anatomy, and in the hospital he took charge of the orthopædic surgery in succession to Bruce Clarke, W. J. Walsham, and Howard Marsh till a department was set up under the care of the first specialist orthopædic surgeon, R. C. Elmslie. When in 1912 he became full surgeon to the hospital his professional activities increased still further. A member of the councils of the Royal College of Surgeons and of the British Medical Association, he examined in surgery for the universities of Cambridge and Glasgow and the Society of Apothecaries, and in anatomy for the final F.R.C.S. He was also chairman of the United Kingdom council of the International Hospital Association.

"When I saw Mr. McAdam Eccles only a few weeks ago," writes A. C., "he seemed to be almost as full of energy as ever, and that is to say a great deal. The first thing that would strike anybody who got to know him was that he was a Bart's man. His retirement from the active staff in no way lessened his interest in the hospital and whenever a special appeal was being made one might be sure Eccles would be in it. Well known in B.M.A. circles, he served on many committees and spoke effectively in its representative meetings. His speech was characteristic of a man who had been many years a successful teacher at his hospital—clear, dogmatic, and forthright. There was never any mistaking what he meant, and he despised the microphone in saying it. He could always be relied upon in anything he undertook—*thorough* was his motto—and I have good reason to thank him for much help. Especially I remember his efforts to interest medical students in the organisation of their profession. His release from active practice led to no slackening in his interests. During the war he organised first-aid work in Marylebone and conducted a centre which was a model of its kind."

In the last years of his long life he was chairman of the medical committee of the Scientific Film Association. "He was," as G. E. G. puts it, "a constant and tireless worker, who loved to work methodically and earnestly, and he went on freely serving, even unto the end."

Mr. McAdam Eccles's later years were clouded by the death of his wife, the daughter of E. B. Anstie, J.P., of Devizes, and of three of his children. He leaves two sons, one of whom, Mr. David Eccles, M.P., is married to a daughter of the late Lord Dawson of Penn.

JOHN HOWSON RAY

M.B., CH.M. VICT., F.R.C.S.

John Howson Ray, consulting surgeon to the Manchester Royal Infirmary and the Royal Manchester Children's Hospital, Pendlebury, and many other institutions, died suddenly at his home on April 30. He had heart weakness but he was up and in his garden on the day of his death.

A Manchester man, who graduated from Owens College in 1894, he was prominent in the medical life of the city for many years. He also had considerable war service, going abroad with the 57th General Hospital in the war of 1914–18 and reaching the rank of brevet-colonel T.A. He was past president of the Manchester Medical Society and the Manchester Surgical Society, and was formerly reader in surgical pathology in the University of Manchester.

"Those who worked with him at the Royal Manchester Children's Hospital," writes C. P. L., "know how much he did for that institution and how great an interest he took in all its activities. For many years he gave a great deal of time to his outpatients, his operative work, and his ward rounds, and was regular in his attendance at the administrative meetings.

"His precise and rather formal manner concealed a fund of humour and a wide knowledge of affairs. To his juniors he was approachable and sympathetic, and always ready to give advice, while his skill with a lathe often enabled him to help them practically if ever they were in need of a special instrument. His personality was such that he has left with those with whom he worked a lasting remembrance of that mixture of kindliness, controlled equanimity, and personal interest which gave him the affectionate nickname of 'Pa Ray.' He was highly respected and liked by the parents of the many patients who came under his care at the hospital, and though it is now some time since he left, his name is still remembered amongst them."

Mr. Ray leaves two daughters and a son who is in practice at Altrincham.

ADOLPH ERDÖS

M.D.

WE have received with regret news of the death of Dr. Erdös, of Oradea, Transylvania, who was one of our regular correspondents for over 30 years. Transylvania was ceded by Hungary to Rumania after the last war, but Erdös was at home in both countries and wrote on the medical affairs of both. Besides a command of several languages, he had a very wide range of interests, and an aptitude for conveying them to others. In 1905 he founded an English Club in Transylvania, which flourished under his presidency and is now coöperating with the British Council. During the German occupation he took his own life on learning that he was to be deported to a concentration camp.

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Notes and News

CONQUEST OF DEAFNESS

STARTING with a demonstration of some of the methods used for diagnosing deafness in adult and infant, the British Council film, *Education of the Deaf*,[1] goes on to consider the plight of the child born deaf and so doomed to dumbness and apparent mental backwardness. The remainder of the film demonstrates how the deaf infant is taught to lip-read and to phonate, and how his schooling is arranged at the Christie School for the Deaf in Manchester. The child of 2–3 years will mimic lip movements silently, and then can be taught to make noises which are meaningless at first but later become intelligible. The 6-year-old has been taught a wide vocabulary, and lessons proper can then begin. At this age the children are split into two groups—those with slight residual hearing who can appreciate the noise from powerful amplifier headphones, and the totally deaf—but both are taught entirely by spoken words. By adolescence they are apparently normal citizens; they are given trade training and jobs are found for them. Many, even though totally deaf, enjoy singing in tune, and have a perfect sense of rhythm for dancing. The film ends with a conversation between a normal person and a congenitally deaf adult woman who has been trained at this school.

Although a long film, *Education of the Deaf* holds the attention throughout; the intense effort on the part of the pupils is so vividly conveyed that the onlooker feels exhausted by the end. The photography is excellent, and although slow at first the direction is so unassuming that it is only after the film is over that one realises what a masterpiece this is—factual documentary at its best, the filmcraft kept subservient to the drama inherent in the subject matter. A point of interest not mentioned is the apparently large proportion of deaf children with squint.

DEPUTATION OF DEMOBILISED

A DEPUTATION of demobilised doctors and dental surgeons from the Socialist Medical Association was received by the Minister of Health on May 22. The difficulties of the period before the National Health Service comes into effect were discussed from the point of view of the intending specialists, the future general practitioner, and the dental surgeon. The specialists spoke of the lack of opportunities now available in hospital practice for their junior members. The general practitioners were uncertain whether to buy practices with borrowed capital or to seek positions as assistants to doctors. It was pointed out that although many general practitioners complained of being much overworked, applicants for assistantships were out of proportion to the number of vacancies available. While there would be a shortage of dental surgeons when treatment for all was available under the Bill, at the present time some dental surgeons were overworked, while those coming out of the Forces were not always fully occupied. The alternatives before the dental surgeon were the school dental service or private practice, the latter involving the purchase of costly and scarce equipment.

The Minister said he anticipated that there would be ample scope for each category of doctor and dental surgeon in the new service. He appreciated the uncertainties of demobilised practitioners during the interim period and he undertook to consider what form of guidance or other help he could give in the near future.

U.S.S.R.'s FIVE-YEAR HEALTH PLAN

LAST autumn the collegium of the Soviet Union's commissariat of health approved the draft of a five-year public-health plan for 1946–50. It is hoped that by the end of this period the number of doctors will have been increased to 15 per 10,000 population, which, it is thought, should enable every person to receive medical outpatient attention twelve times a year. The rural areas are already divided into medical districts, whose number is to be increased by about 2000. Each district centre is to have a hospital of 25–30 beds, at which it is proposed to provide a nursery and specialist and public-health services so that the district will be virtually independent. The antenatal service is to be generally expanded to enable women to attend a doctor about eight times before delivery and two or three times afterwards. Antenatal clinics are to be responsible also for health education, and the establishment will include a midwife, a visiting nurse, and a legal adviser. It is calculated that by the end of 1950 the number of hospital beds will allow of all women in towns and half the women in rural areas having their confinement in hospital; the other half of the women in rural areas will be attended either at maternity homes attached to collective farms or at their own houses. Post-natal clinics are to be strengthened by the addition of two visiting nurses for each district. By 1950, nurseries will have beds for 12% of the infant population. Among other improvements the number of city hospital beds is to be increased by 30%, and the beds in sanatoria and at health resorts are to be doubled.

1. Produced by Donald Alexander for Data Film Unit. Running time, 45 minutes; 16 mm. and 35 mm. sound. London: Central Film Library; free loan.

HOSPITAL LIBRARIES

DURING the war the Red Cross and St. John Hospital Library distributed more than 4 million books to Service patients. It has now been reorganised for peace-time as a department under the chairmanship of Mr. Arthur Bryant, the historian. Besides developing its work in all Service hospitals at home and overseas, it is also offering help to British civilian hospitals. It will continue to give books to form the nucleus of any new hospital library or to restock old ones, and is also starting loan libraries for patients who want special technical or foreign books, or books which are hard to get, especially those on the fine arts. One such technical library is to be kept specially for patients in sanatoria, many of whom are serious readers, with time for a solid course of study. These books for tuberculous patients are to be kept in a separate room, and will be sent only to sanatoria. The hospital library service will continue to be managed largely by the county organisers and their depot holders and librarians. Volunteers are always welcome for this interesting part-time service. Parcels of books go from the headquarters of the department to Service hospitals in North-west Europe, Malta, Gibraltar, Tripoli, Cairo, Jerusalem, the Suez Canal Zone, Lebanon, and Cyrenaica. Those who have been interned in the Far East, and who are now in Shanghai, are receiving books telling the history of the war, and the reviews of the war period, so that they may fill in the lost years. The new headquarters of the Hospital Library Department are at 40, William IV Street, London, W.C.2.

SISTER-TUTOR TRAINING GRANTS

THERE are still a number of vacancies under the scheme announced last September by the Ministry of Health for giving financial assistance to State-registered nurses who wish to train as sister tutors or male tutors. Under this scheme, selected applicants are given an allowance of £150 for the period of training towards the cost of maintenance and incidental expenses, and the training and examination fees are also paid by the Government. The next training course will start in September.

Applicants must be on the general part of the State register or, in the case of male nurses, the part of the register for male nurses (general trained), and must have had at least 3 years' post-registration experience in nursing in hospital, including a year's experience as a ward sister, or corresponding rank in the case of a male nurse. Selected candidates are required to give an undertaking that, if they pass the examination, they will serve as sister tutors or male tutors in hospital for at least 2 years in Great Britain, but they may choose the hospital in which they wish to serve, provided a vacancy exists there.

Any State-registered nurse who wishes to apply for assistance under the scheme should write to the Secretary, Ministry of Health, Division 4AIII, Whitehall, London, S.W.1.

PHYSICAL MEDICINE

THE British Association of Physical Medicine, now well launched, records useful work on behalf of the specialty during the past year. In the annual report of council, Lord Horder, the president, mentions that the association has been admitted to the joint secretariat for specialist associations established by the Royal College of Surgeons. The scientific and technical committee of the association has undertaken to advise manufacturers of physical-medicine equipment. Dr. Philippe Bauwens, medical secretary of the association, has helped the education and training committee to institute courses at Guy's and St. Thomas's Hospitals for part I of the diploma in physical medicine. A similar course will probably be established at Bristol University. Two examinations have been held during the year, and 5 candidates have been successful. At the request of the association the Royal Colleges have

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consented to allow candidates to take parts I and II of the examination separately.

Plans are being made to arrange scientific and clinical meetings to bring together doctors who are interested in physical medicine. A journal is about to be launched, and contact will be made with specialists in physical medicine in the Dominions. The association has been invited to take part in discussions on the organisation of physical-medicine departments in hospitals and factories, and physiotherapy in people's own homes.

JOURNALS ON TOUR

THE Save the Children Fund's administrator in Hungary has sent a message of thanks to readers of THE LANCET who responded to his appeal for British medical periodicals. "Please thank for me," he writes, "all who are concerned in sending the medical papers. They are of infinite value. They go round among the doctors and will finish their career in the library of the central clinic."

Mr. Edward Fuller, editor of *The World's Children* (20, Gordon Square, London, W.C.1), will be glad to receive journals for Hungary.

FORMS OF ADDRESS

THE difficulties arising in medical journalism from the different use of family names in different countries were well set out by our American colleagues, G. H. Simmons and Morris Fishbein in their *Art and Practice of Medical Writing* (1925). The Spanish, they pointed out, often add the mother's maiden name to the father's surname by which they are known—though some Spaniards, as for example the late Prof. Santiago Ramón y Cajal, may choose for personal reasons to be known by their mother's family name. Thus the Spanish physician in consulting English and American literature may be tempted to refer to Dr. Oliver Wendell Holmes as Dr. Wendell.

Despite this guidance we have lately incorrectly described a Spanish author in our columns. Dr. Alzamora Albeniz, the author of a paper on open fractures of the femoral diaphysis which appeared in our issue of April 27, was incorrectly styled at the top of our pages as Dr. Albeniz. He is in fact known as Dr. Alzamora, and his work should be indexed under that name.

Royal College of Physicians of London

The Mitchell lecture will be given by Dr. P. M. D'Arcy Hart on July 9 at 5 P.M.; he will speak on the Search for Chemotherapeutic Agents in Human Tuberculosis during the Past Hundred Years. The Bertram Louis Abrahams lecture will be delivered on July 16 at 5 P.M. by Prof. C. A. Lovatt Evans, F.R.S., whose subject will be the Outlook of Physiology Today.

Royal College of Obstetricians and Gynæcologists

D.R.C.O.G.—Regulation 3, relating to practitioners qualified over ten years, has been reinstated. Applications under that regulation may be submitted forthwith.

West London Medico-Chirurgical Society

The Cavendish lecture will be delivered at 8.30 P.M. on June 18, at Kensington Town Hall, by Sir Lionel Whitby, whose title will be The Magic Bullet and After.

"Living Communities" Exhibition

The National Council of Social Service is holding an exhibition at County Hall, London, S.E.1 (York Road entrance), to show how community centres may be planned, set up, administered, and financed. The exhibition will remain open until June 15 from 10 to 5 daily, and afterwards will tour the provinces.

Home Ambulance Service

The Red Cross and St. John War Organisation has given to its home ambulance service 500 ambulances no longer needed for war work. The service now has more than 600 stations throughout the country and this new gift, which brings the number of its ambulances to almost 1000, will enable it to meet additional local needs. The headquarters of the St. John and Red Cross home ambulance department at 12, Grosvenor Crescent, London, S.W.1, is a central bureau of information for ambulance transport.

Lecture Tour in South America

Sir Howard Florey, F.R.S., is leaving for South America on June 18, to lecture for the British Council on penicillin to both lay and medical audiences. Sir Howard will visit the Argentine, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay, spending about a week in each country. He will travel home via the United States and Canada.

University of London

As announced last week, Dr. J. N. Davidson has been appointed to the chair of biochemistry tenable at St. Thomas's Hospital Medical School.

Professor Davidson graduated at Edinburgh as B.SC. in 1934, M.B. (with honours) in 1937, M.D. in 1939, and D.SC. in 1945. After a year abroad as a Carnegie research fellow in the laboratory of Prof. Otto Warburg, he was in 1938 appointed lecturer in biochemistry in the University of St. Andrews at University College Dundee, and subsequently held the corresponding post in the University of Aberdeen. In 1941 he was elected F.R.S.E. Last year he joined the staff of the Medical Research Council at the National Institute for Medical Research, Hampstead, and he is at present secretary of the Biochemical Society. His early research work dealt with the metabolism of fructose and with the purification of enzymes. In the last six years he has carried out extensive investigations on the nucleoproteins, particularly the cytoplasmic ribonucleoproteins and their relationship to tissue growth.

Prof. A. J. E. Cave, as reported in the last issue, has been appointed to the university chair of anatomy tenable at St. Bartholomew's Hospital Medical College.

Professor Cave qualified M.B., with distinction in hygiene and preventive medicine, at Manchester in 1923. In 1924 he joined the anatomy staff of Leeds University, serving as senior demonstrator and later as lecturer until 1934, when he became senior demonstrator of anatomy and curator of the anatomical museum at University College, London. In 1935 he was appointed assistant conservator of the museum at the Royal College of Surgeons, becoming Arnott demonstrator in 1936 and professor of human and comparative anatomy in 1941. He graduated M.D. in 1937, with commendation for his thesis, and D.SC. in 1943. He delivered Arris and Gale lectures in 1932 and 1941. He has examined in anatomy for the primary fellowship, the membership, and the licentiate in dental surgery of the Royal College of Surgeons, and in anatomy and anthropology for the University of London; he is the author of various contributions on human and comparative morphology, anthropology, and anatomical history. He is the honorary secretary of the Anatomical Society of Great Britain and Ireland.

As reported last week, the title of professor of medical protozoology has been conferred on Colonel H. E. Shortt, I.M.S. retd., in respect of the post now held by him at the London School of Hygiene and Tropical Medicine.

Professor Shortt qualified M.B. at Aberdeen in 1910, after obtaining seven gold medals in medicine, surgery, and physiology. He then entered the Indian Medical Service, and during the war of 1914–18 he held appointments as protozoologist at the Central Laboratory, Basra, as chief malaria officer to the Mesopotamian Expeditionary Force, and in command of the central laboratories at Basra and Bagdad. In 1922–23 he was director of the Pasteur and Medical Research Institute, Shillong, Assam; and in 1924 he was appointed protozoologist to the Kala-azar Commission, of which he was director from 1926 to 1931. He was then director successively of the Pasteur Institute of India, the Central Research Institute, and the King Institute of Preventive Medicine. He graduated M.D. in 1936, and D.SC. in 1938, when he was awarded the Straits Settlements gold medal. In the same year he was appointed reader in medical parasitology in the University of London. On the outbreak of war, however, he returned to India as director of the King Institute of Preventive Medicine, Madras, and in 1941 he was appointed inspector-general of hospitals and prisons, Assam. The next year he reverted to the Army on special duty, and was appointed A.D.M.S., Assam Division; in December, 1944, he undertook a reconnaissance of the Japanese lines of communication between Assam and Burma, from which he made a detailed report on the economic, medical, and political conditions in the Naga Hills and Manipur. He was appointed C.I.E. in 1941, and last year received the Kaisar-i-Hind gold medal. He returned to the London School of Hygiene in April, 1945.

Faculty of Radiologists

The annual meeting of the faculty will be held in Glasgow at the Royal Infirmary, the Western Infirmary, and at the university on June 28 and 29. The programme includes a discussion on Friday the 28th at 11 A.M. at the therapy section on soft-tissue sarcoma, when the opening speakers will be Prof. C. F. W. Illingworth, Prof. R. A. Willis, Dr. D. W. Smithers, and Mr. C. J. L. Thurgar. At 2.30 P.M. at the diagnosis section Dr. Laurence Scott, Dr. S. D. Scott Park, and Dr. Alan Lendrum will open a discussion on pulmonary hæmosiderosis, and Dr. A. E. Barclay, Dr. Peter Daniel, Mr. H. M. Powell, and Miss M. M. L. Prichard will speak on radiomicrography. At 10 A.M. on Saturday the 29th both sections will meet to discuss modern developments in nuclear physics. The speakers are to be Prof. P. I. Dee, F.R.S., Dr. A. S. McFarlane, and Prof. J. S. Mitchell. Further information may be had from the secretary of the faculty, 45, Lincoln's Inn Fields, London, W.C.2.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:—

MR. SAMUEL DAVIDSON, A.F.C., F.R.C.S.E., M.R.C.O.G., 25, Calthorpe Road, Edgbaston, Birmingham, 15 (Edgbaston 2296 and South 0176).

Mr. C. J. B. MURRAY, M.S., F.R.C.S., 66, Harley Street, W.1 (Langham 3883).

Dr. RONALD BODLEY SCOTT, F.R.C.P., 90A, Harley Street, W.1.

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Supply of Penicillin

In reminding the public that penicillin cannot be supplied save on a prescription from a registered doctor or dentist, the Pharmaceutical Society points out that the retail prices fixed by the Ministry of Supply are for dried penicillin powder and not for the various preparations in which it will be used.

British Psycho-Analytical Society

The first of a series of annual Ernest Jones lectures will be delivered by Prof. E. D. Adrian, F.R.S., at the Royal Society of Medicine, 1, Wimpole Street, London, W.1, on June 19 at 8 P.M. Professor Adrian will speak on the Physical and Mental Sources of Behaviour.

Outpatient Time-table

King Edward's Hospital Fund have issued a revised version of their time-table showing the times at which all the outpatient sessions are held in London hospitals. General practitioners have always found this clearly-printed and comprehensive list a valuable standby, saving their time and that of their patients. A limited number of copies are obtainable, free of charge, from Messrs. George Barber & Sons, Ltd., 23, Furnival Street, London, E.C.4.

CORRIGENDUM.—In last week's account of the food situation in Austria (p. 838), distribution for the September-December period was reported as being planned on a basis of 900 calories daily. The daily figure should have been stated as 1550 calories.

Medical Diary

JUNE 9–15

Tuesday, 11th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. *Psychiatry.* Dr. H. J. Shorvon: Depersonalisation Syndrome.

Thursday, 13th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. J. D. Fergusson: Original Observations in Carcinoma of the Prostate treated with Œstrogens. (Hunterian lecture.)

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. H. W. Barber: Erythema Group of Eruptions.

EDINBURGH POSTGRADUATE LECTURES
4.30 P.M. (Royal Infirmary.) Major-General A. G. Biggam: War-time Advances in Medicine which might be translated into Civil Practice. (Honyman Gillespie lecture.)

Friday, 14th

ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Laryngology* and *Otology.* (Torquay council chamber). Prof. Miles Atkinson: Evidence for a Vascular Mechanism in Menière's Syndrome. Mr. A. J. Wright: Menière's Disease. Mr. C. P. Wilson: Treatment of Acute Inflammatory Conditions of the Middle Ear with special reference to Penicillin.
2.30 P.M. Short paper.

Saturday, 15th

ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Laryngology* and *Otology.* (Torbay Hospital.) Clinical meeting.
2 P.M. *Orthopædics.* (Wingfield-Morris Orthopædic Hospital, Oxford.) Cases. Group-Captain J. C. Scott: Organisation of a Regional Accident Service.

Appointments

BRODY, M. B., M.D. Sheff., D.P.M.: deputy medical superintendent, Graylingwell Hospital, Chichester.

CHECCHI, LEO, L.R.C.P.E.: factory surgeon for Penarth, Glamorgan.

CLIVE, F. TEMPLE, M.B. Lond.: medical superintendent, British Legion Village, Preston Hall, Kent.

CUMMACK, D. H., M.B. Edin., F.R.C.S., D.M.R.: radiologist, Dudley Road Hospital, Birmingham.

GARMANY, GERALD, M.B. Manc., M.R.C.P., D.P.M.: senior asst. M.O., Graylingwell Hospital, Chichester.

HARDWICK, S. W., M.D. Lond., M.R.C.P., D.P.M.: medical superintendent, City of London Mental Hospital, Dartford, Kent.

HARRIS, E. O., M.B. Lond., F.R.C.S.: ear, nose, and throat surgeon, St. Andrew's Hospital, Dollis Hill, London.

MACGOWAN, T. A. B. ARNOTT, CH.M. Glasg., F.R.C.S.: orthopædic surgeon, York County Hospital.

MCKISSOCK, WYLIE, O.B.E., M.S. Lond., F.R.C.S.: surgeon, National Hospital, Queen Square, London.

MALLOCH, J. A., M.B. Edin., M.R.C.P.E.: consultant physician, Llanelly and District Medical Service, and physician, Llanelly and District General Hospital.

SLATER, E. T. O., M.D. Camb., F.R.C.P., D.P.M.: physician in psychological medicine, National Hospital, Queen Square, London.

THOMAS, B. A., M.D. Lond.: dermatological specialist medical referee for county-court districts of Abergavenny, Blaenavon, Monmouth, Cardiff and Barry, Chepstow, Newport, Pontypool, Tredegar, Abertillery and Bargoed (circuit no. 24), and of Aberdare and Mountain Ash, Merthyr Tydfil, Pontypridd, Ystradyfodwg and Porth, and Bridgend (circuit no. 30).

On Active Service

MENTIONED IN DESPATCHES

R.A.M.C.

Colonels.—G. Anderton, O.B.E., G. T. Garraway, H. J. R. Thorne, D.S.O.

Lieut.-Colonels.—F. A. Bevan, H. Bambridge, S. M. Cornes, A. L. D'Abreu, O.B.E., J. Fleming, G. M. Frizell, F. D. Hart, A. G. Johnson, B. R. M. Johnson, J. B. King, A. J. C. Latchmore, M.B.E., W. A. Mill, J. D. W. Pearce, R. W. Raven, L. F. W. Salmon, M.B.E., J. R. St. G. Stead, A. Watson, J. B. Bishop.

Majors.—R. V. Facey, G. D. Falconer, R. A. P. Gray, L. C. Beadle, K. Cameron, A. V. Dickie, J. A. P. Evans, D. I. Finer, A. Findlay, R. S. Garden, A. Gourevitch, M.C., J. A. Gordon, F. C. Hyland, D. Jefferiss, H. C. Johnston, C. D. P. Jones, M.B.E., F. Kane, A. B. Kettle, I. Leveson, J. N. Macartney, M.B.E., S. Mackenzie, W. Mackenzie, A. A. MacNair, R. L. Marks, W. E. Mashiter, R. G. Miller, R. Mowbray, P. B. L. Muldoon, A. D. Newsholme, J. G. O'Sullivan, W. A. Owen, E. Pereira, E. H. D. Phillips, H. P. Player, A. H. M. Richards, G. I. M. Ross, M. J. Saunders, J. A. W. Shearer, S. B. Smith, O. H. Theodor, F. L. Turner, W. M. Walsh, W. J. Walter, R. H. Watson, G. A. Wilson, C. L. Worthington, C. W. A. Falconer, B. S. C. Gaster, R. I. McAlley.

Captains.—H. Abramovich, M.C., J. H. Adams, P. B. Angus, J. R. Armitage, C. L. F. Beaton, W. H. C. Bell, J. H. Bennett, O. H. Bostock, J. Brod, T. O. Candler, M. A. Chamberlain, R. C. Connolly, J. H. Cule, R. B. Davies, W. A. J. Donald, L. Dornan, J. F. B. Edeson, P. K. D. Edmunds, G. Godfrey, C. L. Grandage, J. Halliday, J. M. Hilditch, J. R. Horn, D. R. Hughes, F. G. Hunter, P. E. Jackson, D. Klein, M. Knowles, R. A. Lambourne, R. W. Lush, H. N. Mansfield, C. R. McClure, R. McInroy, J. M. Munden, H. B. M. Murphy, D. F. Nicholson, D. A. O'Sullivan, R. T. Parkin, G. H. Parkinson, I. M. Sievers, P. S. Steen, W. R. McL. Stevenson, J. H. Stranger, B. S. Tulloch, J. P. Turney, C. P. Wallace, R. Watson, D. Weitzman, M. H. West, T. K. Whaley, P. J. White, W. W. Willson, L. H. Moore.

Lieutenants.—H. Baker, R. Frankham, W. A. Reynolds.

I.A.M.C.

Lieut.-Colonels.—R. S. Sahi, M.C., A. N. de Quadros, Saiullah Mohammad.

Captains.—M. A. Alvi, G. L. Banerjee, J. K. Chari, M. A. R. Chowdhuri, H. Dubey, Gokal Singh, N. G. G. Raj, G. S. Negi, G. S. Grewal, S. M. Kapur, P. V. Krishnamurthi, S. Mitra, H. P. B. Neku, S. F. D'Costa, S. C. Guha.

Lieutenants.—N. N. Banerjee, J. S. Bains, M. K. Basu.

Births, Marriages, and Deaths

BIRTHS

DORLING.—On May 27, in London, the wife of Mr. George Dorling, F.R.C.S.—a son.

FAIRMAN.—On May 31, the wife of Dr. H. D. Fairman, of Maidstone—a daughter.

GEAKE.—On May 27, at Woking, the wife of Dr. M. R. Geake—a son.

LANCASTER.—On May 25, at Malvern, the wife of Dr. J. S. Lancaster—a son.

MCKELVIE.—On May 26, at Maldon, the wife of Dr. A. M. McKelvie—a son.

PACKMAN.—On June 2, in London, the wife of Surgeon Lieutenant C. C. Packman, R.N.V.R.—a daughter.

POLLOCK.—On May 15, at Asmara, Eritrea, the wife of Lieut.-Colonel C. B. R. Pollock, R.A.M.C.—a daughter.

RHODES.—On May 26, the wife of Dr. Brian Rhodes, of London, W.11—a son.

WALLACE.—On June 2, the wife of Mr. David Wallace, F.R.C.S., of London, S.W.1—a son.

MARRIAGES

BARNIKEL—WYATT.—On May 11, at Weston-Patrick, Hampshire, John Neville Barnikel, major R.E., to Ann Wyatt, M.R.C.S.

BARRY—MATTERS.—On April 24, at Adelaide, South Australia, Hugh Collis Barry, F.R.C.S., to Mary Gordon Matters.

HERRON—THOMAS.—On May 18, at Newton Abbot, Devon, Robert Alexander Crosthwaite Herron, surgeon lieut.-commander R.N. retd., to Anita Thomas (née Wyttenbach).

ROBINSON—HELLIWELL.—On May 17, in London, James Edward Cammell Robinson, major R.A.M.C., to Rosemary Helliwell.

SANDISON—AUSTIN.—On May 18, in Dundee, Andrew Tawse Sandison, M.B., R.A.M.C., to Ann Brougham Austin, M.B.

DEATHS

DAVIS.—On May 16, at Weston-super-Mare, George Edward Peckett Davis, M.B. Durh.

ECCLES.—On May 30, William McAdam Eccles, M.S. Lond., F.R.C.S., aged 79.

EDWARDS.—On May 29, at Templecombe, Somerset, Charles Wright Edwards, F.R.C.S.E.

MACKINTOSH.—On May 27, Duncan Davidson Mackintosh, M.B. Aberd., of Aboyne and Worthing.

MORGAN.—On May 28, at Fairlight, near Hastings, Conwy Llewellyn Morgan, M.D. Lond.

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ACUTE HÆMATOGENOUS OSTEOMYELITIS TREATED WITH PENICILLIN

M. AGERHOLM B.M. Oxfd
J. TRUETA M.D., D.Sc. Oxfd

From the Department of Orthopædic Surgery, Oxford

IN May, 1944, the penicillin clinical trials committee of the Medical Research Council allocated a supply of penicillin for trial in acute hæmatogenous osteomyelitis. In the next eighteen months 30 cases were treated with penicillin. The final results cannot be assessed after so short a time, but we wish to enable those starting to treat this disease with penicillin to profit from our experience and especially to avoid our mistakes.

Of the 30 cases (37 foci) of acute hæmatogenous osteomyelitis treated, 28 were fresh cases, 1 an acute flare-up in an old focus, and 1 a case of eight weeks' standing which had been treated elsewhere with penicillin and surgery. The cases were not selected, though a circular letter was sent to the local general practitioners inviting them to send cases as early as possible direct to this department.

The penicillin was given intramuscularly by drip or by intermittent injection. Intramuscular drips have been used whenever possible, because they are preferred by children and by the nursing staff; the E.M.S. penicillin drip sets are easy to use—100 c.cm. of intravenous saline is used to dissolve the 24-hour dose (maximum 400,000 units a day). Toxic batches of penicillin have occasionally caused local cellulitis, and 3 patients developed "penicillin" abscesses containing sterile pus; all subsided after one aspiration. In 2 cases with penicillin drips there developed on the same day not only pyrexia and local cellulitis but also renal symptoms with frank hæmaturia; in these 2 cases the penicillin was stopped, but otherwise the side reactions have never been more than a nuisance and have never outweighed the advantages of penicillin therapy.

At the beginning of the series we used the standard dose of 100,000 units every twenty-four hours; the initial dose was twice supplemented by an intravenous dose of 50,000 units at operation. For the later cases we increased the initial dose to a maximum of 400,000 units in twenty-four hours; we were encouraged to do this by an increase in the supply and by the published evidence that penicillin is probably not only bacteriostatic but also bactericidal in higher concentrations (Bigger 1944). The highest blood-penicillin level we have obtained is 0·9 unit in 1 c.cm. of blood with 400,000 units in twenty-four hours; the maximum total dose was 3,000,000 units. The rubber tubing used in the drips was tested in vitro with penicillin; one batch of tubing inhibited the action of penicillin. Locally we have used occasionally a penicillin-sulphathiazole powder (500 units per g.) and crude penicillin dissolved in saline. The last 6 cases have been treated systemically with sulphamezathine in addition to penicillin on the basis of laboratory work showing that sulphonamides enhance the effect of penicillin (Chain and Duthie 1945).

MATERIAL AND METHOD

Age of Patients: Of the 30 patients, 27 were between 1 and 15 years, 2 were aged 21, and 1 was aged 32.

Infection: The infecting organism was *Staph. aureus* in 25 cases, an anaerobic streptococcus in 1 case, a hæmolytic streptococcus in 1 case, and was unidentified in 3 cases. A *positive blood-culture* was obtained in 14 cases (all staphylococci).

Duration of disease before admission varied from thirty-six hours to eight weeks.

Foci of Infection: These totalled 37, 4 patients being admitted with more than one focus.

The sites were:

Femur	15	Ulna	1
Tibia	7	Pelvis	3
Fibula	3	Metatarsal	3
Humerus	2	Os calcis	1
Radius	1	Rib	1

Method: When we began this work we decided on two things:

(1) The first cases should be treated, so far as was clinically justifiable, with penicillin alone; and surgery and the sulphonamides should be withheld, so that we could assess the action of the penicillin. Thus we should have a base-line for use in assessing the results when penicillin was supplemented by surgery, sulphonamide, &c., if these should seem necessary later. Adequate immobilisation should be used in all cases.

(2) The penicillin should be given systemically as early as possible. Since at that time there was no full information on weight-dose ratio, the drug was to be given in the then standard dose of 100,000 units in twenty-four hours (intramuscularly).

ILLUSTRATIVE CASE-RECORDS

The first 5 cases were so instructive that we give their histories in detail.

CASE 1.—A boy, aged 6 years, was admitted with two days' history of osteomyelitis of ilium and upper femur on the same side. Blood-culture grew *Staph. aureus*; there was swelling, tenderness, and pain over both bones; abscess formation was doubtful; radiography was negative.

He was immobilised on a hip frame and systemic penicillin (100,000 units in twenty-four hours) was given by drip. After the first twenty-four hours his general condition improved dramatically, his temperature fell, his appetite was good, he slept well and did not complain, and the local condition subsided, leaving no swelling and only two areas of tenderness so small that they were difficult to find.

The result was so dramatic, and penicillin at that time so scarce, that on the fifth day penicillin was discontinued (420,000 units in four and a half days). Six days later, however, his temperature rose, the local signs at both foci returned, and the clinical picture on admission was reproduced. Penicillin treatment was begun again, and the response was again immediate. The second course of penicillin was continued for fourteen days, and afterwards there was no relapse.

There were never any radiographic changes. He was kept in bed for three months, and the final result was perfect. There is no clinical or radiographic abnormality detectable.

This case showed that it was possible to treat osteomyelitis with penicillin alone, but we learnt that the course of penicillin could not be discontinued immediately symptoms subsided without danger of a serious relapse.

CASES 2 and 3.—The next 2 cases admitted were almost identical. A boy, aged 11 years, and a girl, aged 8 years, with two and four days' history respectively and clinical signs of osteomyelitis of the lower femur with abscess formation. Ordinarily the foci would have been explored forthwith; but, instead, penicillin treatment was begun (100,000 units in twenty-four hours), and the affected limbs were immobilised in plaster backslabs.

The response to treatment was less dramatic than in case 1. Both children were toxic for two weeks, and one required blood-transfusion for a low hæmoglobin count in the second week. However, by the end of two weeks both patients had improved, their temperatures were normal, and they had no local pain or tenderness, though there was still soft tissue and bony swelling over the lower half of the thigh.

It seemed that the penicillin alone had successfully treated these two cases as well as the first case. Over the next three weeks, however, there was no change in the swelling round the local lesion, and the successive radiograms showed the spread of decalcification to involve the lower half of the shaft, and the formation of a large subperiosteal abscess over the same area.

In the fourth and fifth week respectively since the onset 100 c.cm. and 20 c.cm. of pus was aspirated, and 500 units of penicillin was injected locally. A profuse growth of *Staph. aureus* (penicillin-sensitive) was grown from the pus. Both patients were discharged in plaster walking callipers after this. In case 2 the bone was sound enough for weight-bearing

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after six months, but there remains a small cavity, which might later develop into a Brodie's abscess.

The radiograms of case 3 are shown (fig. 1). She was re-admitted 10 months after onset, apyrexial but with an abscess pointing over the medial surface of the lower thigh. This was incised, and small pockets of staphylococcal pus were found in the subcutaneous tissues and muscle. They were drained, and the sinus was explored down to the involucrum. In the last radiogram the cortical sequestrum can be seen to be undergoing absorption (fig. 1*f*). The sinus is healing.

However, before the final results of these 2 cases were known, the spread of disease in bone after the penicillin treatment was begun made us doubt the safety or advisability of conservative treatment in cases where there was already abscess formation.

CASE 4.—A boy, aged 5 years, was admitted with four days' history of osteomyelitis of the lower third of the tibia and abscess formation. *Staph. aureus* was grown from the blood. Temperature 102·6° F, condition fairly toxic. With a tourniquet on the thigh the abscess was opened and drained; the bone was drilled, releasing pus under tension; counter-drainage was established, the wound was packed with soft paraffin gauze, a plaster backslab was applied, and systemic penicillin treatment was begun. The patient's temperature fell the next day, his general condition improved dramatically, and his appetite was enormous.

On the fourth and sixth days after operation the wound was inspected; there was *no pus* either from the incision or from the drainage wound. There was a clean granulating wound asking for suture before secondary infection should occur. The wound was sutured in two stages on the twelfth and seventeenth days, and both closures healed cleanly. There was no radiographic change on admission, but radiograms taken a week later showed the area of bone damage. Unlike the cases treated without surgery, there was no further spread of the disease in the bone, repair proceeded and was sufficient for weight-bearing after four and a half months, by which time there was no clinical abnormality apart from the linear scar.

CASE 5.—A boy, aged 3 years, was admitted with four days' history of illness and clinical signs of osteomyelitis of the whole shaft of the fibula and probably abscess formation. Blood-culture sterile, radiography negative. Penicillin treatment alone was tried, but he gradually became more toxic, developed diarrhœa, and became seriously ill.

On the fifth day the leg was explored under tourniquet; a large abscess extending the length of the fibular shaft was evacuated, and the bone was drilled, releasing pus under tension. After drainage of as much pus as possible the wound was sutured over a rubber tube, through which was run 10 c.cm. of penicillin solution (5000 units); the tube was withdrawn before tying the last stitch.

The change from the preoperative condition was startling. The leg had been put on a backslab allowing inspection of the sutured wound. Palpation caused no pain or tenderness in spite of the wound, the general condition improved, his appetite returned, the diarrhœa stopped, and after a week he was really well. The wound healed by first intention. Systemic penicillin was continued for ten days (1,000,000 units). Radiography a week after operation showed involvement of the whole fibular shaft, formation of an involucrum, and repair of the diseased bone. There were no general or local signs or symptoms. The clinical result was perfect; radiography shows sclerosis but no evidence of activity.

GENERAL PRINCIPLES AND ROUTINE OF TREATMENT

After treating these 5 cases we felt justified in adopting the following principles, and we have not found it necessary to modify them in any important particular:

(1) Hæmatogenous osteomyelitis is in part a systemic disease; penicillin must therefore be given systemically.
(2) Systemic penicillin alone can cure the disease provided that (*a*) there is no abscess at the focus, and (*b*) the daily dosage is adequate and treatment is continued long enough (case 1).
(3) Systemic penicillin cannot sterilise an abscess; in cases where an abscess is already present the systemic infection may be controlled, but even after clinical recovery the disease in the bone may progress and lead to extensive destruction of bone (cases 2 and 3). Surgical removal of preformed pus is therefore as essential in this disease as in other infections susceptible to penicillin.
(4) After removal of pus systemic penicillin treatment can prevent further formation of pus (case 4), and therefore primary suture is safe (case 5). In view of the danger of secondary infection in bone, primary suture is a valuable protection.
(5) Operation should include drilling of the bone to release the contained pus, relieve the pressure, and leave conditions most favourable for bony repair.

On these principles we established the following routine:

(1) On admission the history is taken, the patient is examined clinically, radiograms are taken, and blood is collected for culture, count, and sedimentation-rate. (In the early and most successful cases a positive blood-culture may later be the only proof of the infection.)
(2) Systemic penicillin is begun immediately the diagnosis, or probable diagnosis, has been made.
(3) If there is any evidence of an abscess, the area is explored, the abscess evacuated, the bone drilled, and, after removal of as much pus as possible, the wound sutured and the limb immobilised, preferably in such a way that inspection is possible.
(4) If the presence of an abscess is unlikely or uncertain, the part is immobilised and the patient is watched for twenty-four hours. By the end of that time the decision is usually obvious: either there has been a rapid subsidence in the local swelling, palpation is no longer resented, and the general condition has improved; or there has been little general change, and the presence of an abscess has become more obvious. Aspiration has been found to be an unreliable method of excluding the presence of an abscess. The need for surgery can with care be rightly assessed from the clinical examination. In this series, after the first experimental cases, we have not operated on a case which did not need drainage, and we have not omitted to operate on a case which later showed the need for drainage.
(5) The subsequent treatment centres mainly on adequate immobilisation for the affected bone to prevent fractures and dislocations.

TREATMENT AND RESULTS

The treatment adopted and results obtained are summarised below. The results in a case infected with a penicillin-resistant staphylococcus are excluded: the patient was admitted first in the series, three weeks after onset, with four foci, three of which had already been treated surgically. The infecting organism was four times as resistant as the normal *Staph. aureus*, and we had not at the time nearly sufficient penicillin to treat the case with a dose proportionate to the resistance of the organism.

Summary of Treatment.—Systemic penicillin was given in an average total dosage of 1,000,000 units (maximum 3,000,000 units, minimum 600,000 units). The greatest quantity given in twenty-four hours was 400,000 units, and the smallest 100,000 units. The shortest effective course was six days, and the longest course used was fourteen days.

Penicillin was used alone in 9 cases; 2 of these (described above) were early in the series and would now be treated surgically. Thus 7 of 30 cases (about 1 in 4) were suitable for penicillin treatment alone.

Penicillin was combined with surgery in 21 cases. Primary suture was done in 14 and secondary in 5 cases; 2 cases were not sutured. All cases operated on were suitable for primary suture, but this was not realised at first.

Summary of Results.—There were no *deaths*. This is hardly significant in so small a series, but at least one

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Fig. 1—Radiograms of case 3, admitted with osteomyelitis of femur and subperiosteal abscess, and treated with penicillin and by immobilisation. (a) Aug. 22, 1944, on admission, no abnormality visible; (b) Sept. 15, 1944, periosteum raised over distal half of femur; new bone beginning to form over cortex; patchy areas of decalcification; (c) Oct. 25, 1944, after aspiration of 100 c.cm. of pus; periosteum closer to cortex but still detached. A line of demarcation surrounds the sequestrum, whose limits correspond to the raised periosteum; involucrum forming; (d) Feb. 8, 1945, sequestrum surrounded by thin involucrum; (e) Sept. 7, 1945, line of demarcation begins to disappear at upper end of sequestrum, showing revitalisation by blood-vessels; sequestrum smaller and less dense; organisation of involucrum well advanced; reorganisation of diseased metaphysis; (f) Jan. 31, 1946, further absorption of sequestrum.

patient we should have expected to die without penicillin treatment. There were no *metastatic foci* after admission, no *joint involvement* by local spread after admission, no *pathological fracture or dislocation*, and no *recurrence* after apparent recovery. The general disturbance lasted at least three days, at most two weeks, and averaged a week. Only 3 patients required blood-transfusion: case 2 treated without surgery; another patient admitted eight weeks after onset with Hb 42% (Haldane); and another admitted with septic arthritis.

Of 21 surgical wounds 18 healed (13 without complication, and 5 with delay, but no sinus); 1 (unsutured) became secondarily infected; and 2 developed sinuses. Sinuses also developed in 2 cases not operated on.

In 3 cases sequestra have been spontaneously discharged, without reaction, through already healed scars, which healed again. Sequestra have been sought in three of the four sinuses just mentioned but have not been found: the tracks led to the involucrum. Sequestra have been seen in radiograms but have been reabsorbed without any accompanying signs or symptoms, and we have (like other workers) been impressed by the extent to which repair may go on in an apparently normal limb.

Normal range of movement was re-established in 29 cases. The exception is a case of osteomyelitis of the femur, admitted after six weeks with septic arthritis of the knee. Knee range is now from 5° to 90°. One patient with severe osteomyelitis of the whole shaft of the humerus is still in hospital thirteen months after onset for persistent sinus with secondary infection, but there is full movement at elbow and shoulder.

DISCUSSION

Penicillin has changed the course and prognosis of acute hæmatogenous osteomyelitis. It is no longer enough to compare the results with and without penicillin; a new standard is needed. We must no longer congratulate ourselves that any series shows a low mortality, a low rate of metastatic infection, a low rate of joint involvement, a low rate of sinuses. We should deplore that there is any such rate. We know now that, if a case comes to treatment early enough, it is possible with penicillin alone to cause complete resolution of the lesion, and the patient may be discharged from hospital without any disability, perhaps at the end of three weeks. The only regret in these cases is that so often there is no proof of the diagnosis, although there may have been no clinical doubt on admission.

In cases which come to treatment later, when there is already bone damage and abscess formation, there is some difference of opinion on the appropriate treatment. As already described, we treated the first 2 cases of this type with penicillin and immobilisation alone. We found that the systemic infection was controlled; but that, even after all general disturbance had subsided, there remained local swelling, and that radiographic changes spread from the original small focus at the metaphysis to involve half the shaft of the femur. We therefore abandoned this method of treatment and combined penicillin treatment with surgery, which included bone drilling. The results were as good as we had hoped; the systemic response was more immediate (fig. 2), and there was no spreading radiographic change. Repair began in the area first shown radiographically to be involved; there was no spread of the disease to neighbouring bone or joint. The results contrasted so favourably with those of the undrained or undrilled cases that we did not feel justified in withholding surgery from any more cases of this type. One patient was admitted eight weeks after onset from another hospital, where she had had two weeks' adequate penicillin therapy and incision of abscesses without drilling. She showed the same extensive bone damage we had seen in our undrained cases: she also had severe anæmia (Hb 42%). Her general condition contrasted strongly with cases in our own series, though there was no evidence that the infection had initially been more severe.

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Recently two papers have been published on the treatment of acute osteomyelitis with penicillin, one from America (Altemeier and Helmsworth 1945), and one from Edinburgh (MacAdam 1945), with 34 and 40 cases respectively. In both surgery was minimal; one group aspirated pus from the soft tissue and from the metaphysis; the other aspirated or incised soft-tissue abscesses; neither drilled the bone. Both groups report the same radiographic results as we had in our undrained series: "Patchy and ill-defined areas of rarefaction occur first in the metaphyseal area and later spread to the adjacent shaft. For 70 to 140 days the decalcification is progressive." Their interpretation is however surprising: "Early radiological changes are evidence of the degree of initial bone damage; later changes are *part of a process of healing*, and cannot be attributed to continuing infection." But, if the later changes were really part of the process of healing, they would appear in the radiograms of cases treated surgically; none of our operated cases show these changes. The radiograms shown in figs. 1 and 3 provide a contrasting picture.

The conservative method of treatment might be justified if the protracted immobilisation were offset by abolition of sinus formation, and if there were no danger from it. In our series, however, one of the two cases treated without surgery (abscess aspirated after four weeks) broke down after ten months. Where the area of damaged bone is extensive (as in these cases) one would expect this breakdown.

More serious is the danger of spread of the infection to the joint. In MacAdam's (1945) series this happened in 10 of 40 cases (25%), and similar cases are mentioned by Altemeier and Helmsworth (1945) though their number is not given. There was no case of joint involvement after the beginning of treatment in our series; and since this complication is serious and disabling any form of treatment which permits such a high incidence as 25% is of doubtful merit.

We have used the following conception of the disease process as a useful working basis. At the earliest stage there is a small focus of infection in the bone, probably with a septicæmia. If the organism is penicillin-sensitive, penicillin given now will control the septicæmia and limit the focus to an area small enough for resolution. The presence or absence of radiographic changes depends on the size of the affected area and its position.

If, however, penicillin is not given at the early stage, the local infection spreads, and at the same time, in staphylococcal infections, there is a spreading thrombosis; this, with intramedullary œdema, cuts off the blood-supply to areas not directly affected. The infection next reaches the periosteum. The periosteum provides a resistant barrier to penetration but is readily stripped up from the bone, and the pus, which is under considerable tension, may spread subperiosteally the length and circumference of the shaft, causing further interference with the blood-supply. If penicillin is given at this stage the general infection may be overcome; but the pus both within and without the bone, unless drained, remains as a twofold danger. It still contains organisms which may cause general reinfection, secondary foci, and, by local spread, progressive damage to the neighbouring bone and joint. Secondly, by holding away the periosteum from the surface of the bone it prevents it from assisting in its repair; the blood-supply within the shaft may also have been seriously diminished, and in these cases the lack of contact between periosteum and cortex causes considerable delay in repair, and the familiar picture of an involucrum well separated from the shaft and useless to it will appear on the radiograms. If, however, the pus is drained from within and without the bone at the beginning of the penicillin treatment, the blood-supply from the nutrient artery is impaired as little as possible, and the periosteum can renew its contact with the bone surface and take part in the repair. The release of tension within the bone probably also benefits the diseased bone in the acute stage by allowing penicillin to be brought in the blood to the site of the disease.

It is unlikely that any form of needling will be as effective as open surgery in draining pus. We have found at least 100 c.cm. of pus on opening a subperiosteal abscess after all the pus had apparently been aspirated directly previously; and the many pockets likely to exist within the bone make needle drainage of bone even more ineffective.

So long as patients are admitted late, it is unlikely that it will be possible safely to dispense with surgery; but once it is recognised that acute osteomyelitis can be cured if treatment is begun early enough, the diagnosis will probably be more often made in the early stages. It will become as shameful to "watch" a case of acute osteomyelitis until the periosteum is involved as it is now shameful to "watch" an acute appendicitis until the peritoneum is involved. Analysis of this series shows that 16 cases could have been treated earlier.

The disease is not common. The general practitioner may see only two or three cases in a lifetime, but it is important for every doctor to think of it when a child complains of pain over a bone, appears off colour, or has an unexplained fever. Examination of the part in nearly every case, however early, will show that there is a point of exquisite tenderness definitely localised over bone and demonstrable in the most uncoöperative child. In the histories of our patients the pain in the limb often appeared before the illness, and the careful examination of these cases, especially at the metaphyses, may save a patient from months of disablement.

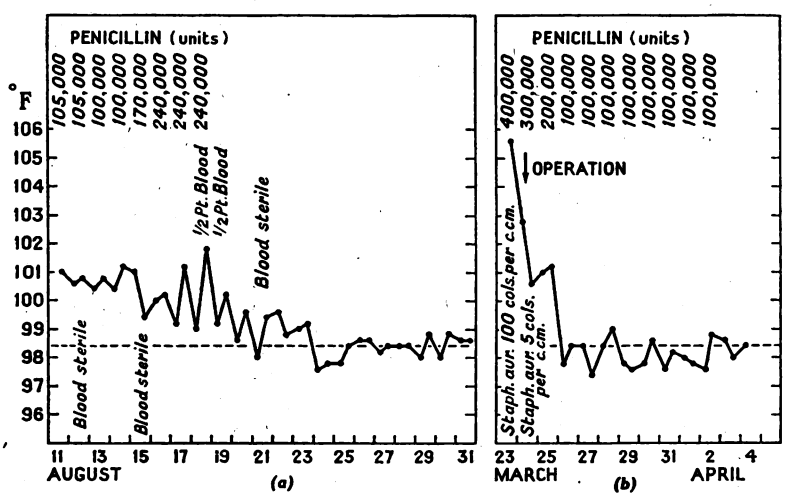

Fig. 2—Comparison of results of treatment with penicillin alone and with penicillin combined with surgery: (*a*) osteomyelitis of femur, 2 days' history and abscess present on admission (case 2) treated with systemic penicillin alone, followed by slow improvement and eventually gross bony change over lower half of femur; 20 c.cm. of pus aspirated in 6th week from subperiosteal abscess; (*b*) osteomyelitis of tibia and septic arthritis of metacarpophalangeal joint of hallux; 100 colonies of *Staph. aureus* per c.cm. of blood; high initial dose of penicillin followed by drainage and primary suture of both foci. Immediate improvement contrasts with (*a*).

SUMMARY

Thirty cases of acute osteomyelitis have been treated with penicillin in eighteen months.

Blood-culture was positive in 14 cases.

Penicillin was first given systemically in a dose of 100,000 units in twenty-four

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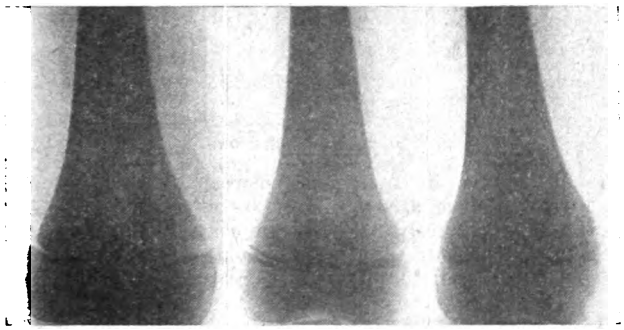
hours. On theoretical grounds this dose was increased in later cases to a maximum of 400,000 units to obtain a concentration which should be bactericidal as well as bacteriostatic. When the infection appeared to be adequately controlled, the dose was reduced to a minimum of 100,000 units in twenty-four hours.

Two well-defined groups of cases were distinguished: (1) those admitted before the bone was seriously damaged and before pus had formed; and (2) those admitted with an abscess already present.

Group 1 could be treated successfully by systemic penicillin alone, provided the course was sufficiently long and intensive; the condition might resolve without



(a) (b) (c)

Fig. 3—Radiograms of a boy (case 6) admitted with osteomyelitis of femur and subperiosteal abscess. Treated with penicillin and by evacuation of abscess, bone drilling, primary suture, and immobilisation. Contrast with case 3. (a) Dec. 6, 1945, on admission, negative; (b) Jan. 4, 1946, localised area of decalcification, periosteum not separated from shaft; (c) Feb. 14, 1946 (9 weeks after onset), no further spread of the disease, clinically normal with full range of knee movement.

any radiographic bone changes; 7 out of 30 (1 in 4) cases admitted were suitable for this treatment. Group 2 must be treated surgically, as well as with penicillin, and surgery must include release of pus in the bone by drilling; after this, primary suture is safe and advisable to prevent secondary infection.

Cases in group 2 not treated by surgery as well as penicillin developed a spreading decalcification of the bone, the area of which increased over 1–5 months. Workers at other centres have confirmed this.

In this series there was no death, no joint involvement, and no secondary focus after admission. At the end of eighteen months, 4 cases still have a sinus, but 2 of these are nearly healed; 28 cases have normal function; one patient admitted with septic arthritis of knee has limited range of movement; one has a sinus which keeps her in hospital.

The importance of surgical drainage in these cases is discussed.

One case of infection with a penicillin-resistant organism was encountered early in this series. It is not included in the series, because at the time we had not sufficient penicillin for its adequate treatment. It was four times as resistant as the normal staphylococcus; it would have required at least 400,000 units of penicillin in twenty-four hours for bacteriostasis. The case serves as a reminder that the sensitivity of the organism must always be tested.

We wish to thank Prof. H. J. Seddon, whose interest initiated and made possible the investigation; Mr. G. R. Girdlestone and Mr. W. B. Foley, who allowed us to treat their cases with penicillin; Dr. E. S. Duthie, of the William Dunn School of Pathology, and Dr. W. J. D. Fleming, of the Radcliffe Infirmary bacteriological department, for valuable advice and assistance; and Sister Walker, whose help in the children's ward overcame many difficulties.

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DIET IN THE TREATMENT OF INFECTIVE HEPATITIS

THERAPEUTIC TRIAL OF CYSTEINE AND VARIATION OF FAT-CONTENT *

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IN a previous paper [1] we reported on the therapeutic trial of methionine in 50 cases of infective hepatitis. The results indicated a slight beneficial effect, but on statistical analysis it did not appear that the differences observed between treated and control groups were significant. Subsequently, supplies of the sulphur-containing amino-acid cysteine were obtainable through the Ministry of Supply, and it was decided to carry out further trials with this substance.

The effects of dietary factors on the course of infective hepatitis have been studied by several workers, and the comparability of their results has sometimes been in doubt owing to the uncertain influence of other dietary constituents, particularly the amount of fat included. Though most observers have used a basic low-fat diet, others (including ourselves) gave a generous allowance of fat; and it was thought desirable to compare the effects of high-fat and low-fat diet on the course of the disease. It was therefore decided to combine a comparison of high-fat and low-fat diets with the therapeutic trial of cysteine.

METHODS

Five grammes of *dl*-cysteine was given daily by mouth in morning and evening doses of 2·5 g. The amino-acid has an objectionable taste, which may be accentuated by chemical changes following repeated exposure to the air. It was therefore stored in small nitrogen-filled containers holding a week's supply, and the requisite amount was made into solution immediately before administration. The solution was mixed with sweetened fruit juice to disguise the taste. Treatment started on admission of the patient to hospital and was continued until the urine became bile-free by the foam test. The mean period of administration was 11·1 days. A series of 103 Service cases was studied, alternate patients serving as controls. The effects of differences in the fat-content of the diet were studied in the same series of patients, alternate members of the control and treated groups being placed on high-fat or restricted-fat diet (approximately 200 g. and 70 g. of fat respectively) during the period of biluria. The protein content of the diet was similar in both groups and was maintained at approximately 100 g. after the appetite returned.

As in the methionine trials, a combination of clinical and biochemical criteria was used to assess the effects of treatment on the duration and severity of the disease.

Clinical observations included duration of anorexia, jaundice, liver enlargement, period in hospital, and frequency of relapses. A relapse consisted of a return of or increase in symptoms and biluria with a secondary rise in serum-bilirubin level; very occasionally a rise in serum-bilirubin level was the only manifestation of a relapse.

Biochemical tests included duration of biluria (with the foam test) and of hyperbilirubinæmia (elevation of serum-bilirubin level above 2·0 mg. per 100 c.cm.), and the improvement in hippuric-acid synthesis (with Quick's intravenous modification) during the first week of treatment. In the trial of methionine previously

* A report to the Medical Research Council.

1. Wilson, C., Pollock, M. R., Harris, A. D. *Brit. med. J.* 1945, i, 399.

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reported, hippuric-acid synthesis was determined shortly before discharge. Since the rate of improvement of this liver-function test is greatest during the first week of treatment, it was decided to compare the values during this period in the present trial. Accordingly 20 unselected cases in the treated group and 20 in the control group were investigated. Hippuric-acid synthesis was determined on the day after admission and again seven days later; the results are expressed in g. of sodium benzoate detoxicated. All time intervals were measured from the day on which treatment started.

COMPARABILITY OF TREATED AND CONTROL GROUPS

All subjects were Service cases, and there was no significant difference in age-distribution between the control and treated groups. It is important that the groups studied should be comparable in severity and in the duration of the disease before treatment was started. The duration was taken as the interval between onset of symptoms and admission to hospital. A further indication of the stage of the disease was obtained by comparing the percentage of cases in each group admitted while the serum-bilirubin level was still rising. Criteria of severity of the disease on admission were provided by the initial serum-bilirubin levels (cases being divided into those with rising and those with falling serum bilirubin levels) and the admission values of the hippuric-acid synthesis test. Results of this analysis are included in table I, which shows that in both the cysteine and the dietary trials the control and treated groups were comparable in the criteria enumerated.

TABLE I—COMPARABILITY OF GROUPS

—	Cysteine	Controls	High fat	Low fat
Duration before admission (days)	7·8	9·6	9·5	7·9
Percentage admitted with rising serum-bilirubin level	39	40	45	34
Serum-bilirubin (mg. per 100 c.cm.) on admission:				
(1) Cases with rising serum-bilirubin level	6·3	7·2	6·5	7·2
(2) Cases with falling serum-bilirubin level	6·3	7·8	7·2	6·9
Hippuric-acid synthesis on admission (20 cases in each group)	0·70	0·64	0·724	0·650

RESULTS OF CYSTEINE THERAPY

From table II it will be seen that for most of the criteria compared, the difference between the treated and untreated groups was about three times the standard error, which must be taken as a significant difference. Exceptions were the duration of anorexia and the length of stay in hospital. Length of stay of Service patients in hospital depends on many factors besides the duration of the disease, which probably explains this exception. The lack of any significant difference in the duration of anorexia is unexplained, but this is the only criterion which does not seem to depend directly on liver damage.

These results appear to indicate that cysteine exerts a beneficial effect on the recovery of liver function in infective hepatitis. It must, however, be pointed out that the differences between the treated and control groups are in the main due to the greater number of relapses among the controls. Even a minor relapse usually causes considerable delay in recovery; and, if all relapses are excluded from the analysis, the differences between the groups almost disappear; for instance, the D./S.E. for the duration of hyperbilirubinæmia in the two groups would drop from 3·38 to 1·29—i.e., the difference is no longer significant. Unfortunately, the number of relapses is too small to enable us to determine with a reasonable degree of certainty whether

TABLE II—EFFECT OF CYSTEINE AND OF HIGH- AND LOW-FAT DIETS ON SEVERITY AND DURATION OF INFECTIVE HEPATITIS

—	Cysteine	Controls	Difference	D./S.E.	High fat	Low fat	Difference	D./S.E.
Number of cases ..	52	51	..	..	51	52	..	..
Duration of—								
anorexia (days)	8·0	10·2	2·2	1·16	10·0	8·3	1·7	0·89
jaundice (days)..	14·1	21·2	7·1	3·0	17·2	18·0	0·8	0·32
liver enlargement (days).. ..	16·5	26·4	9·9	2·73	19·9	22·1	2·2	0·59
biluria (days) ..	11·1	15·8	4·7	3·14	13·8	12·9	0·9	0·56
hyperbilirubinæmia (days) ..	11·5	19·8	8·3	3·38	15·8	15·5	0·3	0·11
Period in hospital (days)	36·8	40·9	4·1	1·46	37·5	40·1	2·6	0·93
Improvement in hippuric-acid synthesis* ..	0·29	0·127	0·163	2·05	0·23	0·19	0·04	0·49
Number of relapses	2	10	8	..	6	6	0	..

* 20 cases in each group.

the difference in incidence between the two groups is likely to have arisen merely by chance, or whether cysteine acts mainly by preventing such relapses. Our conclusion that cysteine is of benefit in the treatment of infective hepatitis must therefore remain tentative.

EFFECT OF VARYING THE FAT-CONTENT OF THE DIET

It is traditional to feed jaundiced patients on a low-fat diet. The rationale for such a regime is not clear, but there are several reasons why reduction of fat in the diet may appear desirable. The most compelling reason is the repugnance often felt by the patient for fatty foods; there is also the consideration that absorption of fat is deficient in the absence of bile from the intestine, although, taken alone, this might be an argument for increasing rather than reducing the amount of fat ingested. Again, animal experiments have demonstrated that a high-fat diet predisposes to liver damage, but the proportion of fat in the animal diets has been excessive compared with the content of the normal human diet.

We have not found that patients with infective hepatitis are intolerant of fat. With few exceptions they prefer buttered bread to dry bread and rarely refuse milk drinks, cheese, or eggs. In fact the so-called fat-intolerance of these patients is largely an intolerance of *greasy* foods. If greasy dishes are avoided, fat in various forms is generally acceptable.

The main objection to a low-fat diet is the difficulty of restricting fat alone. Under present conditions it is not easy to maintain an adequate caloric intake when milk, cream, cheese, butter, eggs, and meat-fat are excluded. It appeared desirable to observe a controlled series of cases in which the fat-content of the diet was varied; for, if there is no virtue in the traditional low-fat diet, the patient may as well benefit from more palatable and nourishing food during his recovery, with the saving of much administrative labour.

The investigation was carried out concurrently with the cysteine trials, alternate cases in the cysteine-treated and control groups being admitted to separate wards for administration of high-fat or low-fat diets. Patients on the high-fat diet received the fat, cheese, and egg ration and the cream from the milk of patients on the low-fat diet. The protein content of both diets was adjusted to about the same value by adding skimmed milk and bread.

Sample analyses of the food consumed were made in 4 cases in each group at different stages of treatment and gave the following mean figures:

High-fat diet.—Fat 202 g., protein 99·5 g., carbohydrate 216·5 g., total calories 3056.

Low-fat diet.—Fat 68 g., protein 91·5 g., carbohydrate 279 g., total calories 2025.

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Though there was no restriction of carbohydrate, the patients on low-fat diet did not eat enough to bring their caloric intake to the level of the high-fat diet.

With the criteria previously described, it will be seen from table I that the two groups were comparable except that the group on high-fat diet contained a rather higher percentage of cases admitted with rising serum-bilirubin level. This might be expected to lead to a rather longer recovery period for this group. In fact, however, the criteria of severity and duration of the disease after admission (table II) showed negligible differences between the two groups. These results therefore provide no evidence that a high-fat diet has a harmful effect on the course of infective hepatitis.

SUMMARY

The administration of 5 g. of cysteine daily by mouth to 52 patients with infective hepatitis produced a significant shortening of the period of recovery compared with 51 control cases. This appeared to be due to the smaller number of relapses in the treated group.

A comparison of the progress of 52 patients on a low-fat diet with that of 51 on a high-fat diet revealed no significant difference in the rate of recovery.

HÆMOPOIETIC ACTION OF 5-METHYL URACIL (THYMINE) IN TROPICAL SPRUE *

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IT has been shown that the administration of synthetic 5-methyl uracil (fig. 1) in large doses is followed by a striking hæmatological response in persons with addisonian pernicious anæmia in relapse (Spies et al. 1946a and b, Frommeyer et al. 1946). Since it is impossible to distinguish the bone-marrow of persons with tropical sprue from that of addisonian pernicious anæmia, it seemed worth while to test the effect of large doses of this substance in persons with the macrocytic anæmia of tropical sprue in relapse. The present report is concerned with our observations in 4 such cases.

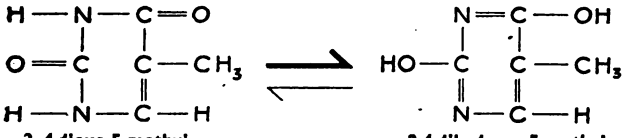

Fig. 1—Methyl uracil (thymine).

In the selection of patients for this study the following criteria were used: (1) the patient must have glossitis; (2) he must have diarrhœa, characterised by voluminous foul-smelling frothy liquid yellow stools, with an increased fat content as determined by chemical analysis; (3) a body-weight loss of at least 20 lb. must have taken place during the six months preceding the initiation of this study; (4) he must have a macrocytic hyperchromic anæmia with a red-cell count of 2,500,000 or less per c.mm. and a colour-index of 1·0 or more; (5) there must be megaloblastic arrest of the sternal bone-marrow; (6) there must be free hydrochloric acid in the gastric juice on fractional analysis after histamine stimulation; (7) he must have a flat oral glucose-tolerance curve as determined by an increase in blood-glucose of no more than 10 mg. per 100 c.cm. in subsequent blood samples compared to the fasting specimen, no sample being greater than 105 mg. per 100 c.cm.; (8) the blood-calcium level must be low, but not below 8·5 mg. per 100 c.cm.; (9) the serum amylase and lipase activity must be normal; (10) the intestinal pattern on radiography must have a "moulage" appearance; and (11) the patient must not have had specific therapy within the five weeks preceding the initiation of the study.

* University of Cincinnati studies in nutrition at the Calixto Garcia Hospital, Havana, in coöperation with the Institute of Nutrition of Cuba and the University of Havana.

METHOD

The patients thus selected were admitted to hospital. A complete dietary and medical history was obtained, and complete physical and neurological examinations were made in each case, as were base-line laboratory and hæmatological studies. The hæmatological studies included a packed cell volume (P.C.V.) with blood indices and daily reticulocyte, erythrocyte, and hæmoglobin determinations as previously described (Spies et al. 1945). Sternal bone-marrow was obtained by aspiration before treatment and on the day after the peak reticulocytosis. Gastro-intestinal X-ray examinations were made before treatment and on the fifteenth day of therapy. Glucose-tolerance tests were done before and after treatment. The stool (the laboratory findings will be reported separately) was examined for parasites, cultured for bacteria, and analysed chemically for total fat, neutral fat, and fatty acids. The diet of each patient was standardised and rigidly controlled throughout the study and contained no meat, meat products, fish, fowl, milk, or eggs. All other foods were allowed in any amount desired.

After the base-line studies had been made, each patient was given a total of 15 g. of synthetic 5-methyl uracil daily, which was weighed on an analytical balance and given in two 7·5-g. doses, one at 10 A.M. and one at 3 P.M. Each dose was suspended in half a glass of hot water immediately before administration; and, after the patient had drunk this mixture, the glass was rinsed thoroughly with water, which the patient also drank to ensure his getting as much of the substance as possible.

The results of the base-line laboratory studies are shown in table I. Table II shows the P.C.V. and blood indices obtained before therapy. In table III the hæmatological effect of synthetic 5-methyl uracil in each of the 4 patients is shown.

Examination of the sternal bone-marrow obtained on the day after the peak reticulocytosis showed that in each case the marrow consisted largely of normoblasts, with almost complete obliteration of the megaloblastic arrest seen in the preparations obtained before therapy. Radiography of stomach and intestines showed a substantial decrease in intestinal motility as well as a decrease in the spasm and dilation and in the amount of "puddling" of barium in comparing the films taken after therapy with those taken before therapy. The glucose-tolerance tests indicated that intestinal absorption improved after therapy.

CASE-RECORDS

CASE 1.—A white man, aged 34, was admitted to the Calixto Garcia Hospital on March 14, 1946, with four months' history of anorexia, diarrhœa, and loss of weight. He had begun to have 4–6 liquid voluminous yellow foul-smelling stools daily four months before admission. Fifteen days later he had noted soreness of the mouth and tongue, aggravated by hot or cold foods, and a sensation of epigastric fullness and great abdominal distension after meals. The anorexia and weakness had become progressively worse, and in four months he had lost 40 lb. in weight. His diet had been inadequate in protein and in the vitamin-B complex before his illness, and since his illness it had been inadequate in all the essential nutrients.

He was an emaciated pale man, with diffuse generalised fine desquamation of the skin of the entire body. The buccal mucosa was œdematous and reddened, but there were no ulcers. No other abnormality was found.

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TABLE I—LABORATORY FINDINGS

Case	Blood chemistry			Stool analyses			Gastric analyses	
	Blood-calcium (mg. per 100 c.cm.)	Amylase activity (units per 100 c.cm.)	Lipase activity (c.cm. of N/20 NaOH per 100 c.cm.)	pH	Fatty acids (c.cm. of N/10 NaOH per 10 g. of moist fæces)	Parasites	Fasting	After histamine
1	10·5	87	1·0	6·0	15	*Trichuris trichiura* (ova)	Achlorhydria	Hypochlorhydria
2	11	75	1·0	7·5	5·5	None	Normal	Hypochlorhydria
3	10	83	1·0	6·5	12	*Tr. trichiura* (ova)	Hypochlorhydria	Hypochlorhydria
4	10·8	..	..	..	..	*Chilomastix mesnili* (trophozoite)	..	..

He was given 7·5 g. of 5-methyl uracil twice daily by mouth for fourteen days, and then 5 g. a day for sixteen days. Two days after the start of treatment his appetite improved, even though the initial reticulocyte rise did not occur until the fifth day of treatment. A peak reticulocytosis of 14·8% was reached on the ninth day of therapy. By the thirtieth day the erythrocyte count was 3,690,000 per c.mm. of peripheral blood, and the Hb 13·2 g. per 100 c.cm. of peripheral blood, a net increase in erythrocytes of 1,500,000 and in Hb of 3·9 g. within a thirty-day period of treatment. A dramatic clinical response paralleled the hæmatological response. His appetite became tremendous. The glossitis improved, and he had a great increase in strength and sense of general well-being. On the fifth day of treatment his stools decreased to one a day and became a normal brown though only half-formed.

CASE 2.—A white man, aged 37, was admitted to the Calixto Garcia Hospital on March 23, 1946, with a history of three years' diarrhœa and anorexia. His illness had begun with severe meteorism, followed by diarrhœa consisting of 4–6 liquid or semi-liquid yellowish foul-smelling voluminous stools a day. Defæcation had been accompanied by a burning sensation in the rectum. Anorexia had become severe, and his mouth and tongue sore; and he had developed paræsthesia of the hands and legs, pain in the epigastrium, and profound weakness, all of which had become progressively worse. Four months before admission he had received liver extract and some other unknown medications for one and a half months, and striking improvement had followed this therapy. Two and a half months before admission, however, he had begun to lose weight, and within this period he had lost 25 lb. He had relapsed rapidly in the month before admission. He had had chronic glomerulonephritis for the past twenty years. For many years his diet had been inadequate in all nutrients.

He was an emaciated pale man and appeared extremely depressed. Emaciation was so great that it was possible to encircle his biceps completely with the thumb and middle finger. Scaling of the skin was generalised; and over the ankles, knees, and shoulders there were areas of hyperpigmented skin. The hair was dry and lustreless. There was slight vascular injection of the bulbar conjunctivæ of both eyes. The tongue was smooth and œdematous and showed clearly the imprint of the teeth; the tip and edges were red, and there were several blotchy red areas over the dorsum. The buccal mucosa was œdematous and red, but there were no ulcers. A loud systolic murmur was heard at the apex of the heart, and extrasystoles were frequent. There was a tympanitic percussion note over the abdomen, but no other abnormality was found either in the abdomen or elsewhere.

He was given 7·5 g. of 5-methyl uracil by mouth twice daily for fourteen days, and then 5 g. a day for sixteen days. The reticulocyte rise began on the fifth day of therapy and reached a peak of 17% on the ninth day (fig. 2). By the thirtieth day the erythrocytes had increased by 1,360,000 per c.mm., and the Hb by 4·1 g. per 100 c.cm. After eight days of treatment there was a profound clinical improvement; his appetite increased remarkably; his tongue became normal subjectively and objectively; his stools decreased to one a day, were dark brown and more normal in consistence though still not well formed.

CASE 3.—A white woman, aged 73, was admitted to the Calixto Garcia Hospital on March 14, 1946, with a year's history of anorexia, weakness, and insomnia. Six months after the onset of these symptoms she had developed diarrhœa, which had lasted seven days. During this time she had had 10–15 liquid yellow foamy stools a day, which she did not consider to be voluminous or foul-smelling. Soon after the onset of diarrhœa she had noted soreness and redness of the mouth and tongue, aggravated by food of any kind. Her appetite had become very poor, and she had become extremely weak. Six months before admission, treatment by a physician had been followed by good improvement; but when specific therapy had been discontinued she had relapsed rapidly. She had chronic cholecystitis and cholelithiasis. Her diet had been deficient in protein and vitamin-B complex before her illness but since then had been inadequate in all nutrients.

TABLE II—PACKED CELL VOLUMES AND BLOOD INDICES BEFORE TREATMENT

Case	Packed cell volume (%)	Mean corpuscular vol. (c. μ)	Mean corpuscular Hb (μμg.)	Mean corpuscular Hb conc. (%)	Colour-index
1	31	158	43	27	1·4
2	30	141	47	33	1·5
3	25	143	46	32	1·5
4	29	141	48	30	1·5

She was a pale woman with evidence of moderate loss of weight. There was generalised scaliness of the skin. Over both forearms, near the wrists, there were several large ecchymoses; and over both buttocks, at the points of pressure, there were two large areas of hyperpigmentation. The bulbar conjunctivæ showed slightly increased vascularity. The tongue was not smooth but was reddened at the tip and edges, and there were several white papules on the dorsum. The buccal mucosa was pale and œdematous. The liver was palpable 1 cm. below the right costal margin and was not tender. The vulva showed a moderate erythema throughout but no other

TABLE III—ANTI-ANÆMIC EFFECT OF 5-METHYL URACIL IN SPRUE

Case	Erythrocytes (millions/c.mm.)			Hæmoglobin (g./100 c.cm.)			Leucocytes (per c.mm.)				Reticulocytes (%)			5-methyl uracil (g. per day)	Days of administration
	Initial	14 days	Final day	Initial	14 days	Final day	Initial	7 days	14 days	30 days	Initial	Day of peak	At peak		
1	2·19	3·07	3·69 (30)	9·3	12·8	13·2 (30)	7300	9500	10,300	7000	2·4	9	14·8	15 5	14 16
2	1·97	2·81	3·33 (30)	8·7	11·8	12·8 (30)	7700	13,950	15,200	13,100	1·2	9	17·0	15 5	14 16
3	1·58	2·30	2·19 (30)	7·0	9·8	9·2 (30)	4450	15,300	16,300	69,800	1·0	9	23·6	15 5	14 16
4	1·91	..	2·66 (10)	8·8	..	12·8 (10)	4400	18,300	..	..	1·4	8	30·2	15	9

Days from commencement of treatment shown in parentheses.

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abnormality. There was evidence of a moderate generalised peripheral arteriosclerosis. Neurological findings were essentially negative.

She was given 7·5 g. of 5-methyl uracil by mouth twice daily for fourteen days, and then 5 g. daily for the next sixteen days. The reticulocyte response began on the fourth day of therapy, and a peak reticulocytosis of 23·6% was reached on the ninth day. By the thirtieth day the erythrocytes numbered 2,190,000 per c.mm. of peripheral blood, and Hb was 9·2 g. per 100 c.cm. She showed little clinical improvement. This may be explained by an acute exacerbation of the chronic cholecystitis and cholelithiasis which began a day before the start

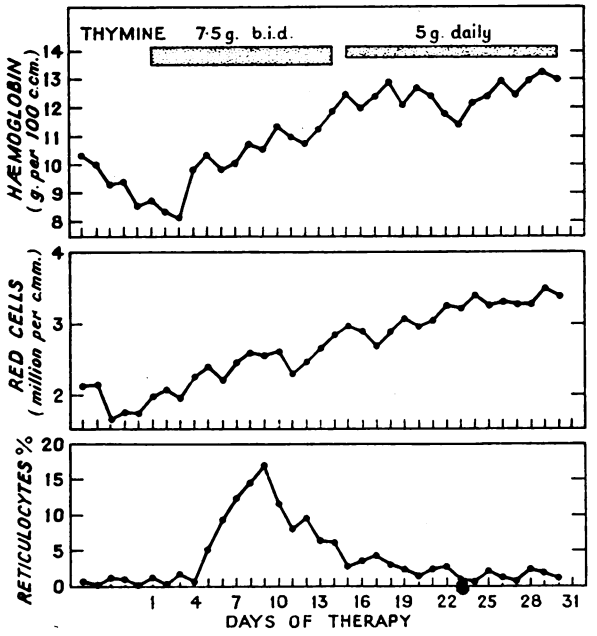

Fig. 2—Blood findings in case 2.

of therapy and lasted fifteen days. Her stools became normal in frequency, colour, and volume on the fifth day of treatment, though they did not become completely formed.

CASE 4.—A white man, aged 65, was admitted to the Calixto Garcia Hospital on April 1, 1946, with ten years' history of epigastric distress and intestinal meteorism. Six years before admission he had been in hospital because of similar symptoms, after which he had been symptom-free for five years. At the end of this time he had developed severe flatulence, intestinal colic, soreness, redness, and ulceration of the mouth and tongue, severe anorexia, progressive weakness, œdema of the feet, and diarrhœa consisting of 15–20 voluminous liquid yellow foul-smelling stools daily. Defæcation had been accompanied by a burning sensation in the rectum. Three months before admission he had developed severe paræsthesia of both legs and arms, vertigo, tinnitus, and insomnia. During the twelve months before admission he had lost 50 lb. His diet had been deficient in all nutrients for the past ten months.

He was an extremely emaciated pale weak senile mentally confused man, apparently greatly depressed. He wept easily and often. The skin was generally scaly, and the hair was dry and brittle. His tongue was semismooth, very red at the tip and edges, and had several small white spots the size of a pinhead on the dorsum near the root. The buccal mucosa was œdematous and reddened, and there was a pronounced vermilion border on both the upper and the lower gums; there were no ulcers. The bulbar conjunctivæ showed a slight increase in vascularity. The chest showed signs of pulmonary cavitation, which was confirmed by radiography. There was a soft systolic murmur at the apex of the heart, and frequent extrasystoles were present. The abdomen was excavated; the liver was enlarged 2 cm. below the right costal margin and was extremely tender but of normal consistence. Dilated loops of intestine could be felt through the very thin abdominal wall, and many intestinal rushes were heard on auscultation. There was evidence of moderate arteriosclerosis of the peripheral vessels, and moderate bilateral calf, nerve-trunk, and muscle tenderness of the lower extremities. No œdema of the feet was present.

He was given 7·5 g. of 5-methyl uracil by mouth twice daily. Reticulocytosis began on the fourth day of treatment and reached a peak of 30·2% on the eighth day. By the tenth day there had been an increase of 750,000 per c.mm. in erythrocytes, and 4 g. per 100 c.cm. in Hb. On the fourth day of treatment his stools became normal in number and colour, although they were not well formed. Despite acute tuberculosis, he responded clinically on the seventh day of treatment; his appetite increased, and a feeling of well-being returned. On the tenth day of treatment he signed his release from the hospital against our wishes.

SUMMARY AND CONCLUSIONS

A definite hæmatological response took place in each of 4 patients with the macrocytic hyperchromic anæmia of tropical sprue in relapse after the daily administration of 15 g. of synthetic 5-methyl uracil by mouth.

Reticulocytosis began on the fourth or fifth day of therapy, reached its peak on the eighth or ninth day, and was followed by an increase in erythrocytes and hæmoglobin.

Clinical improvement was shown by an increase in appetite and strength, a disappearance of glossitis and burning and soreness of the tongue, and a return of the stools toward normal, as early as the fourth day of therapy in case 1. The stools did not become completely formed during our short period of initial observation. Over a much longer time they may become normal on our regimen of treatment, or it may be that the diet we used was a contributory factor in the delay of the return of the stools to normal consistence. Certainly we do not recommend a diet such as we employed in this study for the treatment of tropical sprue. On the contrary, the patients are advised to eat a diet high in protein, minerals, and vitamins, and low in fat and carbohydrates.

These studies, along with previous observations, show that synthetic 5-methyl uracil is an effective hæmatopoietic substance for the macrocytic anæmias of both tropical sprue in relapse and pernicious anæmia in relapse. The hæmatological response effected by synthetic 5-methyl uracil, when given to patients with the macrocytic anæmia of tropical sprue in relapse, parallels that which follows the administration of synthetic folic acid. The clinical response, however, at this dose level is less dramatic than that observed with folic acid.

We are indebted to Dr. Aureliano Rodriguez and Dr. Carlos Castellanos for the gastric analyses; Dr. Juan Bencomo and his assistants for the blood-chemistry determinations; and Dr. Emilio Morales for the chemical determination of fat in the stools. In special nursing care of the patients in this study we were assisted by Miss Flora Villate, Miss Angela Pedraza, Miss Maria de los Angeles Perez, Miss Eva Averoff, and Mrs. Eleanor Bennett. The dietary studies and controls were conducted by Miss Jean Grant and Mrs. Myrtle Neblett. The expenses were borne by grants from the Edward Mason Williams Memorial Fund and Lederle Laboratories Inc. The 5-methyl uracil was supplied by Hoffmann-La Roche Inc.

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THE work of the Family Planning Association shows steady progress, especially in the study and treatment of sterility and subfertility. The investigation centre for these conditions, opened at 33, Wimpole Street, London, W.1, last year, has received increasing numbers of patients month by month, and is now self-supporting. A successful conference on seminology, held in Cambridge last July, enabled medical workers in this field to meet workers in animal genetics. Branch clinics of the association are following the lead of the Exeter clinic, and developing work on subfertility. The main office is at 69, Eccleston Square, S.W.1.

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ESTIMATION OF PALUDRINE IN BLOOD

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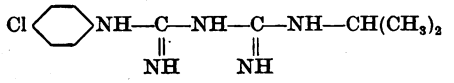
PALUDRINE (N_1-*p*-chlor-phenyl-N_5-*iso*propylbiguanidine) is one of a series of chemically related drugs which have been shown to possess considerable antimalarial activity (Curd et al. 1945, Adams and Sanderson 1945). The formula is:



The method of estimation to be described has been applied successfully to several of this group of compounds. Though the estimation of paludrine is described, the method is suitable without modification for these related compounds.

The work of Adams et al. (1945) has shown that the blood-paludrine levels achieved with therapeutic dosage are about 10–100 μg./100 ml. A method is therefore required capable of estimating 0·5–5·0 μg. of paludrine. One such method is in existence (Spinks and Tottey 1945) depending on pressure hydrolysis of paludrine and the formation of an azo-dye from the liberated *p*-chloraniline.

Acid dye laking provides an alternative procedure, which is rapid and simple, of sufficient accuracy for clinical needs. Methods of estimating other antimalarials by a similar reaction have been published by Brodie and Udenfriend (1945) and Marshall and Rogers (1945).

PRINCIPLE

Paludrine can be extracted quantitatively from whole blood by heating with strong NaOH and shaking with benzene containing 2% (v/v) ethanol (Spinks and Tottey 1945). If to this benzene solution is added a solution of brom-thymol blue (buffered at pH 7·0), and the mixture is shaken at room temperature, coupling takes place, with the formation of a benzene-soluble compound of paludrine and brom-thymol blue. Since the uncoupled brom-thymol blue is insoluble in benzene, a partition of the dye takes place. An amount equivalent to the paludrine present passes into the benzene, while the excess brom-thymol blue remains in the aqueous phase. After separation of the phases, the coupled dye may be recovered by shaking the benzene with aqueous alkali, and this offers a practicable method of estimation. We have preferred to keep the number of manipulations to a minimum, and instead estimate the decrease of the brom-thymol blue contained in the aqueous phase. Sensitivity is increased by adding to this a drop of strong alkali and so developing the deep blue of the dissociated indicator.

EXPERIMENTAL

By many preliminary trials the following facts were established:

(1) As described by Spinks and Tottey (1945), the extraction of the base from whole blood by benzene is quantitative. Difficulties were encountered at first from emulsion formation during the initial shaking, but this was readily controlled by increasing the amount of benzene-ethanol reagent in proportion to the amount of blood taken.

(2) Coupling of the base with brom-thymol blue takes place rapidly and is complete within five minutes when shaking at room temperature (20° C).

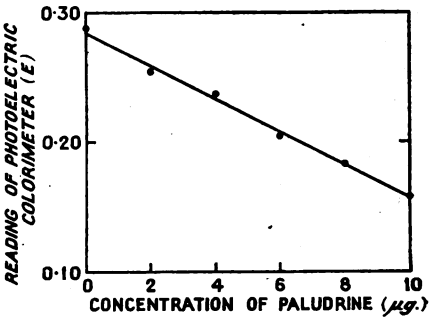
(3) When a series of standard solutions of paludrine are shaken with brom-thymol blue solution, the optical density of the aqueous phase is a linear function of the amount of paludrine present, within the limits of experimental error (see figure).

(4) Normal blood not containing any paludrine has a negligible blank value when fresh. If left unrefrigerated for more than a few hours, a blank develops, equivalent to about 0·5 μg./5 ml. blood.

METHOD

Apparatus.—Colorimeter, preferably photoelectric, with microcells and a suitable light filter; mechanical shaker; 50-ml. glass-stoppered bottles; 25-ml. glass-stoppered centrifuge tubes; 50° C bath.

Procedure.—Blood 5 ml., distilled water 5 ml., and 10 *N*-NaOH 2·5 ml. are pipetted into a 50-ml. glass-stoppered bottle. The mixture is heated in a 50° C bath for 30 min., then cooled to room temperature. Benzene-2% ethanol reagent 25 ml. is added, and the bottle is shaken, preferably on a shaking apparatus, for 5 min. The bottle is then placed in a centrifuge cup and spun at 2500 revolutions for 30 min.



Plot of extinction (E) against microgrammes (μg.) of paludrine.

With a teated pipette 20 ml. of the clear upper benzene layer is removed to a glass-stopperèd centrifuge tube; *x* ml. of brom-thymol blue reagent is added, and the tube shaken for 15 min., then spun at 2000 revolutions for 5 min.

A capillary pipette is connected with tubing to a water pump. A complete removal of the benzene layer, with minimal loss of the aqueous phase, can be achieved by cautiously lowering the tip of the pipette below the surface of the liquid in the tube.

To the remaining aqueous solution of brom-thymol blue is added a micro-drop of 10 *N*-NaOH, and the optical density of the resulting deep-blue solution is measured in a colorimeter. Since the differences of extinction are small, it is an advantage to use a photoelectric instrument. Increased sensitivity is achieved by the use of an orange filter with maximal transmission about 6000 A. A suitable filter is Ilford spectrum orange 607, or Ilford tricolour red. The concentration of the base corresponding to this optical density is obtained by reference to a standard curve.

Standard Curve.—A solution of paludrine containing 1 mg./100 ml.—i.e., 1000 μg./ml.—is diluted appropriately with distilled water to prepare standards containing 0, 2, 4 . . . 10 μg. in 5 ml.; 5 ml. volumes are treated as blood, and a standard curve is drawn showing extinctions against concentration. This curve is linear within the limits of experimental error and is reproducible; hence it need only be repeated at intervals.

Reagents are as follows:

1. *Stock brom-thymol blue:* 0·04%; 40 mg. of the powder is dissolved by heating and shaking in 100 ml. of 1% alcohol.

2. M/15 *Phosphate buffer:* pH 7·0, 3·63 g. of KH_2PO_4 + 14·35 g. of $Na_2HPO_4.12H_2O$ in 1 litre. (A drop of brom-thymol blue added to 5 ml. of this buffer should give an apple-green colour, indicating pH 7.)

3. *Brom-thymol blue reagent:* The strength of this solution depends on the range of concentration which it is desired to estimate, and on the final volume of solution required for

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colorimetry. It is advisable to add about 0·5 ml. more than is required for colorimetry, to allow for small losses in manipulation. To estimate the range 0–10 μg. of paludrine, the reagent added must contain 0·1 ml. of the stock 0·04% bromthymol blue. Thus, if the final volume required is 2 ml., the reagent should contain 0·1 ml. of stock in 2·5 ml. or

$0{\cdot}1 \times \frac{100}{2{\cdot}5}$ ml. of stock per 100 ml. = 4·0 ml. of stock/100 ml.

Thus 4·0 ml. of stock is diluted to 100 ml. with *M*/15 phosphate buffer pH 7·0. The solution is preserved with a drop of chloroform and kept in the refrigerator. The actual strength of the reagent is not critical; but it must be kept constant if the standard curve is to remain applicable.

4. 10 N-*NaOH*.

5. *Benzene-2% ethanol:* 2% absolute alcohol in purified benzene.

6. *Standard paludrine solution:* 100 mg. of the base dissolved in 100 ml. of distilled water.

Notes.—Scrupulous cleanliness of glassware must be observed; glass apparatus should be cleaned overnight in chromic acid. The purity of the benzene is important; it should be shaken with 1/10 volume of conc. sulphuric acid and redistilled from all-glass apparatus.

RESULTS

Estimations have been carried out by this method in parallel with the diazo-method of Spinks and Tottey (1945). Agreement between the methods has been good. The mean concentration found in a series of blood samples from volunteers taking paludrine was 48 μg./100 ml., estimated by the dye method, and 47 μg./100 ml. by the diazo-method. The standard error of the difference amounted to 15 μg./100 ml. This is small enough to be unimportant in clinical use.

This method has been developed at the suggestion of the chemical and pharmacological subcommittee of the malaria committee of the Medical Research Council. A grant from the M.R.C. to defray the costs of the investigation is gratefully acknowledged.

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SALMONELLA INFECTION IN MAN
CONVEYED BY DUCKS' EGGS

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CASES of human infection with organisms of the salmonella group, *S. typhimurium* (*aertrycke*) and *S. enteritidis* (Gaertner), through the medium of ducks' eggs have from time to time been reported and Gordon and Buxton (1945) have reported a fatal case. Although infection with these organisms was known to occur, meat being the commonest agent (Van Ermengen 1896), it was not until 1906 that Le Coq showed that ducks' eggs, in this case egg albumin used in the preparation of whipped cream, could convey the infection to man; and it was he who first pointed out that ducks' eggs can harbour bacteria within them. He traced the infection of the eggs to the oviducts and thought that it gained entry during coitus in ponds, where fæcal contamination is common. In support of his view he demonstrated the presence of vegetable material in the egg albumin.

Scott (1930), by immersing eggs in bacterial cultures, proved experimentally that infection could reach the inside of the egg through an intact but moist shell; but, if the shell was kept dry, the egg never became infected. Although most eggs became infected within a few days in moist culture media containing living organisms, one egg in fifteen appeared unaffected after immersion for as long as six weeks.

Doyle (1927) described an epidemic of diarrhœa in chicks due to *S. typhimurium* (*aertrycke*) and pointed out the possibility of the organisms permeating the egg-shell, but he adduced no proof for his theory.

Scott (1930) cited Low as having, in 1913, made investigations into the mode of infection of ducks' eggs and as having shown that a general blood-borne disease caused by *S. typhimurium* (*aertrycke*) might affect the ovaries and the oviducts, and thus in turn the eggs. This was found to be true for several organisms, and the infecting strain of the mother bird has been found by several workers, notably Rettger and Scoville (1920), in the organs of the newborn duckling. It appears that birds which are infected at birth do not reach adult life.

Further work by Scott (1932, 1933) produced a clear chain of evidence that ducks infected with *S. typhimurium* (*aertrycke*) produced infected eggs capable of causing more or less serious gastro-enteritis in man. Dalling and Warrack (1932) made the same observation with regard to *S. enteritidis* (Gaertner), showing that this organism could pass from the bird to the egg, and so to man, in whom the typical disease developed.

The eggs of various other birds, notably pigeons (Beaudette 1926, Clarenburg and Dornickx 1932) and hens and geese (Lovell 1932), have been cited as possible causal agents of human gastro-enteritis. Schütt (1931) found that 6·6% of healthy pigeons were carriers of *S. typhimurium*, and Baars (1931) considered in his paper the possibility that poultry establishments may become infected by their droppings. There seem, curiously perhaps, to be no observations about plovers' eggs.

From a survey of the literature, however, it does appear clear that bacterial food-poisoning by eggs, when it occurs, is practically always through the medium of ducks' eggs.

Beller and Reinhard (1934) in a long series of ducks' eggs taken from 34 different farms found that about a fifth of these produced contaminated eggs, and that in some localities the percentage of the infected eggs was as high as 8%, and that taking their whole series about 1% of ducks' eggs were infected with salmonellæ when gathered and therefore unfit for food. In brief, therefore, the following facts appear established:

(1) Ducks' eggs can convey infection by *S. typhimurium* (*aertrycke*) or *S. enteritidis* (Gaertner) to man, and very severe and even fatal cases have occurred.

(2) The eggs may become infected at coitus, while lying in the body of an infected hen bird, and, after they are laid, from being in contact with contaminated ground and moisture. This last factor would explain the relatively high incidence of infection among the eggs of pond ducks.

(3) Pigeons have been shown to cause gastro-enteritis in man through the medium of infected eggs; but the hen's egg appears to be of negligible significance in this connexion, owing presumably to their nesting and mating conditions, though occasional cases have been described.

CASE-RECORD

A woman, aged 47, was admitted to hospital in September, 1945, with a history that she had fried three ducks' eggs for breakfast the same morning. All the family had the same meal; except that only three of them ate these eggs; and two of the three were taken ill. One egg, eaten by her son, tasted quite normal, and he remained perfectly well; the other two eggs were described as having a slight "metallic" taste, and for that reason the patient's daughter ate only a portion of her egg. The daughter had symptoms of mild gastro-enteritis of rapid onset but was quite well again in thirty-six hours. The patient, who consumed the whole egg, developed pain round the umbilicus, with vomiting and diarrhœa,

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which started within about three hours of the meal, and, when first seen three hours later—i.e., six hours after the meal—she had already got cramps and was prostrated.

For the next five days the patient remained seriously ill. She had vomiting and diarrhœa, but the stools, though green and offensive, never contained blood or mucus. There were rigors and profuse sweats which aggravated the dehydration. Large doses of sulphaguanidine were without effect.

On the sixth day the vomiting ceased. The patient was now pale and listless, with sunken eyes and temples. There was tenderness and enlargement of the spleen, and the whole abdomen was painful to palpation.

From this time the temperature remained down, and there was steady improvement; but diarrhœa persisted until the end of the second week of the illness, with considerable tenesmus and abdominal pain. There was bilateral mydriasis for the first fortnight of the illness.

Serum agglutination tests showed at the 8th day agglutination to *Bact. paratyphosum B.* O (titre 1/250), non-specific salmonella H (titre 1/250), *S. typhimurium (aertrycke)* H (titre 1/50). This most strongly suggested infection with *S. typhimurium*.

Stools.—One of three specimens taken on the 8th day gave a growth of *S. typhimurium*.

Blood.—There was a leucocytosis of 20,000 per c.mm. at this time. Blood-urea 67 mg. per 100 c.cm. Erythrocyte-sedimentation rate never went higher than 15 mm. in 1 hour (Westergren).

Rectal examinations, swabs, and cultures showed that no carrier state persisted at the time of discharge.

After the end of the second week the diarrhœa ceased and progress was rapid; the only feature complicating convalescence was an ischiorectal abscess, which ruptured spontaneously.

DISCUSSION

The clinical picture was typical of severe food-poisoning produced by bacterial toxins and not associated with intestinal ulceration. It was extremely severe; and, as is not infrequently the case with this group of diseases as compared with the bacillary dysenteries, so great was the abdominal pain that an acute abdomen was at one time suspected. The illness did not respond to sulphaguanidine, though the drug may have had some effect on living salmonellæ; but a stool culture was positive after the drug had been given in full doses, and the action of the toxins was in no way diminished by it as judged from the symptoms.

The history of the eggs is of some interest. The farm from which they came had 86 ducks, among which were 8–10 drakes. It was stated that practically all the eggs laid were fertile, and that they had never been known to produce any case of food-poisoning before these. The eggs were laid at night in the field and were picked up every four days; but there is always the chance that certain eggs might have been overlooked when the collection was made, and there is no evidence of how long the eggs in question may have been in contact with damp, and presumably infected, ground. The fact that these were two isolated cases, and that there has been no trouble in rearing the ducks on this farm, seems to favour the view that the organisms invaded the eggs through the surroundings rather than through infected egg-layers or by some other route.

CONCLUSION

The old wives' tale, so often met among country folk, that ducks' eggs are not safe for human consumption seems to be founded on truth. In this case the eggs had a queer taste but did not appear stale or unfit to eat. Cooking for five minutes did not destroy the toxins or, at any rate wholly, the organisms. To be safe for eating, ducks' eggs should have the following attributes: they should come from healthy birds; they should be gathered daily; and, above all, they should be laid in dry uncontaminated surroundings. No egg that has been exposed to damp nesting conditions should be regarded as safe to eat. Fertile eggs are probably less safe than non-fertile; and, if the ducks have received some additional mineral salts and produce eggs with good shells, this would be an added safeguard.

We are indebted to Prof. A. W. M. Ellis, under whose care this patient was originally admitted to hospital, for his help and permission to record the case.

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ANTICOAGULANT ACTION OF SOYA-BEAN TRYPSIN-INHIBITOR

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THE existence of an anti-trypsin in soya-bean was reported by Ham and Sandstedt in 1944, and by Bowman in the same year. Kunitz (1945) isolated it in crystalline form, and kindly gave us a sample to assist our investigation of fibrinolysis by certain human tissue extracts, since both Christensen (1945) and Mirsky (1944) have found that trypsin-inhibitors are anti-fibrinolysins. One of our preparations, a fraction of lung-extract, is extremely potent, both as a fibrinolysin and as a thrombokinase, and since the soya-bean material inhibited the former action, its effect on the latter, and on blood-clotting in general, became a point of interest.

Freshly drawn human blood was added to equal volumes of a range of saline dilutions of the inhibitor in Wassermann tubes kept at 37° C. The time of clotting increased with the concentration of inhibitor though the results were not regular. Row A in the table illustrates a representative experiment. The use of recalcified citrated or oxalated plasma in place of whole blood gives highly reproducible results, citrate being preferable because of the absence of a precipitated calcium salt. Row B shows the proportionality between the amount

COAGULATION TIMES OF DIFFERENT SYSTEMS IN THE PRESENCE OF INCREASING CONCENTRATIONS OF SOYA-BEAN TRYPSIN-INHIBITOR

Expt.	Final conc. of inhibitor (mg. per 100 ml.)	0		1·6		3·1		6·2		12·5		25		50		100	
		M	S	M	S	M	S	M	S	M	S	M	S	M	S	M	S
A	Whole blood	4	23	6	53	10	25	9	35	13	25	24	50	20	20	28	2
B	Recalcified plasma	4	17	5	20	6	2	9	17	12	14	18	43	24	10	>60	0
C	Fibrinogen + thrombin		12		10		8		10		10		14		20		34
D	Plasma + thrombin		12		12		12		14		15		14		22		58
E	Recalcified plasma + lung extract		58	2	2	3	9	4	10	4	41	7	23	..		..	
F	Recalcified plasma + Russell's viper venom 1/10,000		29		31		40		45		52	1	55	3	50	12	35

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of inhibitor and delay in coagulation of recalcified citrated plasma.

This effect may be due to interference by the inhibitor with (*a*) thrombin, (*b*) prothrombin, or (*c*) thrombokinase, if the classical theory of coagulation be accepted for the moment, and attempts were made to differentiate between these possibilities.

Constant amounts of human thrombin were incubated for 10 minutes with a range of inhibitor dilutions, samples of the mixtures being added to human fibrinogen. The results, shown in row C, indicate a depression of thrombin action when the concentration of inhibitor is 25 mg. or more per 100 c.cm. Similar results are obtained if citrated plasma is substituted for fibrinogen solutions (row D). This effect, however, seems too feeble to explain completely the delay in clotting of recalcified plasma observed with 3 mg. of inhibitor or less per 100 c.cm., particularly since the amount of thrombin used in experiments C and D is only a fraction of that generated in plasma during coagulation.

Systems containing added thrombokinase were then studied. Constant amounts of dilute lung extract were incubated with dilutions of inhibitor, and added to plasma which was then recalcified. The coagulation times are given in row E, and show a pronounced delay even with the lowest concentration of inhibitor. In row F a 1 in 10,000 solution of Russell's viper venom, which acts in most respects like a pure thrombokinase, is substituted for lung extract; the results, having regard to its greater coagulant action, are similar.

The findings suggest, but do not prove, that the main action of the inhibitor is on thrombokinase, rather than on prothrombin or thrombin. Proof is technically difficult to obtain until a method of removing or inactivating the inhibitor without disturbing the other reactants is available, but additional evidence is provided by two further experiments. The first makes use of the fact that Russell's viper venom acts in extremely high dilutions. A volume of the 1/10,000 solution of venom was incubated with a volume of inhibitor solution containing 200 mg. per 100 c.cm. The mixture was then diluted to 100 volumes with saline. A control volume of venom was treated in the same way, saline being substituted for inhibitor solution. Volumes of these two preparations were added to equal volumes of citrated plasma, which was then recalcified with the following results:

1. Venom and inhibitor: mean of 6 estimations	3 min. 43 sec.
2. Venom control: mean of 6 estimations	1 min. 16 sec.
3. Plasma control	3 min. 45 sec.

In this experiment the final concentration of inhibitor is only 1 mg. per 100 c.cm., so that no significant antithrombic activity would be expected. Nevertheless, the clotting time of system (1) is nearly three times as long as (2). This result is probably due to the almost complete inactivation of the venom during its incubation with the inhibitor before dilution. Though action by the dilute inhibitor on the plasma prothrombin cannot be definitely excluded, it seems unlikely from the previous findings that it could have produced such an effect at so low a concentration.

It was found, moreover, that the coagulant activity of a thrombokinase-inhibitor mixture depends to some extent on the time for which they have been incubated together. The coagulation times of recalcified plasma to which has been added mixtures of thrombokinase and inhibitor incubated for increasing periods are shown below. The figures are the means of three determinations in each case:

Time of incubation	1 min.	2 min.	10 min.
Venom + inhibitor	41 sec.	47 sec.	51 sec.
Lung extract + inhibitor	40 sec.	45 sec.	49 sec.

The prolongation of clotting time with time of incubation, though not very pronounced, indicates a direct reaction between the thrombokinase and the inhibitor.

The foregoing results are of considerable interest from the point of view of the mechanism of blood-coagulation, since they support the view that enzymatic proteolysis is an integral part of the normal process.

Ferguson (1942) reported that crystalline pancreatic anti-trypsin had anticoagulant properties that he thought were due mainly to action on thrombin. Grob (1943), however, observed no effect on thrombin. In our hands a sample of this inhibitor (also obtained from Dr. Kunitz) had actions similar to the soya-bean material, but has only about 1% of its anticoagulant activity.

SUMMARY

Crystalline soya-bean trypsin-inhibitor appears to be a potent anti-thrombokinase, with a slight inhibitory effect on thrombin.

A sample of crystalline pancreatic trypsin-inhibitor had a similar but much less potent action.

We wish to thank Dr. M. Kunitz, of the Rockefeller Institute, for giving us the samples of inhibitors tested. We are grateful to Dr. R. A. Kekwick, of the Lister Institute, for supplies of human fibrinogen and thrombin. The investigation, of which these observations are an incidental part, is financed by the Medical Research Council.

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Medical Societies

BRITISH ORTHOPÆDIC ASSOCIATION

THE spring meeting was held at the Royal Victoria Infirmary, Newcastle-on-Tyne, on May 24 and 25, under the presidency of Mr. GEORGE PERKINS.

Mr. E. A. NICOLL reported on 150 miners who had suffered *fractures of the thoracic or lumbar spine*, which he classified into (*a*) simple anterior wedge, (*b*) lateral marginal fracture (whose special features he defined), (*c*) fracture-dislocation, and (*d*) fracture of the neural arch. The results of simple wedge fracture did not depend necessarily upon the presence or absence of deformity. Hyperextension treatment would not promote repair of a concomitant intervertebral disk injury and was often itself a source of chronic lumbar strain; consequently he now preferred early exercises with no more restraint than bed rest.

Mr. J. K. STANGER dealt with cases of *fracture-dislocation of the spine*, which occurred mostly in the thoracolumbar and midcervical regions. Paraplegia was commonest with injuries at the narrowest parts. Recoverable cases of paraplegia could not be distinguished from irrecoverable, and consequently reduction should be attempted. In open reduction of cases with locked facets partial facetectomy is rarely required; and exposure may even reveal that spontaneous reduction has begun, only hyperextension being required for its completion. Although the results of open reduction in these cases with locked facets and paraplegia were exceedingly disappointing, and although closed reduction could be achieved, Mr. Stanger did not yet feel able to advocate the latter as the usual procedure. Fixation was by plaster jacket, or by plaster bed if posterior structures were fractured. Redislocation, which was frequent, did not cause recurrence of cord symptoms and was often followed by bony ankylosis. The first evidence of recovery from paraplegia might appear as late as six weeks after the injury, and the extent of delay was no measure of the prognosis. Patients with various degrees of recovery after paraplegia from fracture-dislocation were shown.

Mr. W. GRANT WAUGH gave a restrained account of his researches into the pH of *acute and chronic joint effusions*, and of his attempts to modify this by the injection of appropriate liquids. A clinical estimate was given of the results of treating the joints in osteoarthritis

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and rheumatoid arthritis by intra-articular injections of a solution of lactic acid and procaine of approximately constant pH. The injections were followed by exercises, and later manipulations, which were facilitated by the injections and formed an integral part of the treatment. Procaine solutions were not a satisfactory substitute. Mr. Waugh asked for trial of the method by others. Some present were able to report encouraging results.

Mr. K. H. PRIDIE advocated *excision of the calcaneus* in very severe cases of comminution and showed film strips to demonstrate the supple feet, good gait, and powerful plantar flexion power which might follow this procedure if continuity of tendo Achillis and plantar fascia were maintained. He considered that the subcutaneous fibro-fatty pad and the partially regenerated bone provided a serviceable heel. In the lively discussion which followed, the consensus was in agreement with Mr. Pridie's condemnation (following Eastwood) of immobilisation of these fractures, strong in advocacy of early movement without weight-bearing, but condemnatory of so drastic an operation and particularly its performance through a longitudinal dorsoplantar incision.

Mr. E. W. KNOWLES had found that *midtarsal dislocation* might follow either a fall from a height or a torsion injury such as that resulting from a fall with the forefoot trapped. Reduction was very insecure. Consequently he advocated transfixion of the joint with a Kirschner wire passed through scaphoid and talus and incorporated in plaster-of-paris for four weeks.

Mr. J. B. REID had investigated the results of McMurray's displacement *osteotomy of the femur* in osteoarthritis of the hip and in ununited fracture of the femoral neck. Of 36 patients with osteoarthritis, 28 were completely relieved of pain. Among 13 patients with ununited fractures union followed in 7 and 1 patient died.

Mr. P. H. NEWMAN discussed the clinical diagnosis of *fat embolism*, which had been frequent in war injuries and, if sought, would probably be found to be correspondingly frequent in civil life. Mention was made of the psychological changes, pyrexia, tachycardia, increased respiratory rate, raised blood-pressure, petechiæ of characteristic distribution, fundus changes, and presence of fat in the last-voided urine, and the lack of information given by the sputum. The importance of efficient splinting and transport of patients with fractures was stressed. Mr. Newman had ligated the deep femoral vein in two cases, one of which had recovered.

Mr. A. GRAHAM APLEY gave a preliminary demonstration of a test designed to aid discrimination between meniscal or other soft-tissue *injuries of the knee*.

Clinical cases shown included unilateral adolescent coxa vara (slipped upper femoral epiphysis) in father and each of twin sons (Mr. C. GORDON IRWIN), tendon transplantations (Mr. J. GILMOUR and Mr. DAVID BROWN), melorheostosis, osteoid osteoma (Dr. W. MACKENZIE), and some results of nerve suture (Mr. F. G. ST. CLAIR STRANGE).

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

AT a meeting of this society held at Newcastle on May 3, Mr. S. A. WAY analysed a series of 500 cases of the *lower-segment cæsarean sections* performed by him, and compared it with the results of a smaller series communicated to the society by Mr. Harvey Evers in 1934. In 320 of Mr. Way's cases the reason for operation was disproportion between the head and the brim of the pelvis, while in 74 the reason was a low-lying placenta. The maternal-mortality rate for the whole series was 3·4%, which on analysis was found to be highest in the "failed forceps" group (4·3%) and in placenta prævia (2·7%). This maternal-mortality rate was lower than in the series of 1934, and he attributed this decrease to treatment of septic cases with the sulphonamide drugs.

Mr. F. J. BURKE reported a case where pregnancy followed tubal reimplantation performed for complete occlusion of each tube near its insertion into the uterine wall, and Dr. G. P. MILNE and Mr. T. J. ROBINSON described cases of developmental abnormalities complicating pregnancy and labour. Mr. LINTON SNAITH described skin reactions to a placental extract in cases of toxæmia of pregnancy, and Mr. HARVEY EVERS reported malignant disease of the vulva in a girl of 17.

Reviews of Books

A Textbook of the Practice of Medicine

(7th ed.) Editor: FREDERICK W. PRICE, M.D., F.R.C.P., consulting physician, Royal Northern Hospital, London. London: Oxford University Press. Pp. 2034. 42*s*.

FOR better or worse, the day of the comprehensive textbook of medicine by one man is over. True a general textbook as good as the earlier "Oslers," carrying the accumulated wisdom of a senior physician, will always be a godsend to the student, for without attempting to be comprehensive such an author can instil general principles. We may even have reached already the heyday of the multi-author textbook, for our knowledge of medicine has become so extensive that such omnibus volumes grow unwieldy. We may shortly see "Price," and its like, replaced by clinical monographs, each dealing with a particular system of the body or a particular group of diseases.

It is exceedingly difficult to get a team of distinguished contributors to present an integrated picture of medicine, and a careful editor, determined to prevent overlapping and yet to leave out no essential matter, may find he has to scatter related data under various headings. Thus in the new edition of "Price" rheumatic fever and rheumatic heart disease are dealt with in separate sections by different authors; amœbic dysentery is described by one author in the section on general infectious diseases, and amœbic abscess by a different author in the section on the digestive tract. To introduce the student to medicine by this watertight-compartment technique is surely not sound. Again, it seems overambitious to include long sections on such wide specialties as the exanthemata, dermatology, and psychiatry. There might also be a more serious effort to discard what is purely of antiquarian interest. But taken all round "Price" remains one of the best textbooks of medicine published in this country.

Forensic Chemistry and Scientific Criminal Investigation

(4th ed.) A. LUCAS, O.B.E., F.R.I.C., formerly director, chemical department, Egypt. London: Edward Arnold. Pp. 340. 25*s*.

Lucas's well-known book has achieved deserved popularity in forensic laboratories all over the world. His long practical experience in all departments of forensic laboratory work and his industry at the bench are plainly reflected in the text of this new edition, which is rich in practical hints and refinements of technique. From the examination of clothing to the extraction and isolation of alkaloids the same great care for detail is plainly revealed. He deals equally faithfully with dusts, hair, counterfeit coins, documents, fibres, firearms and projectiles—a fine section—and explosive bombs ("thrown at various Egyptian Ministers"). There are still no illustrations, but in a book for the expert rather than the tyro they are unnecessary, and their absence has kept both price and dimensions reasonably low. Elimination of an elementary opening chapter and of much repetition of references would also save space.

Acari as Agents transmitting Typhus in India, Australia, and the Far East

SUSAN FINNEGAN, PH.D. British Museum (Natural History) Economic Series no. 16. Pp. 78. 1*s*. 6*d*.

SCRUB-TYPHUS presented an unexpectedly severe military problem in south-east Asia and the south-west Pacific areas. Practical experience of the disease was rare, and systematic knowledge of the vectors was rarer still. Dr. Finnegan's book is intended to make more easily available to those in the field the hitherto inaccessible knowledge on the mites and ticks believed responsible for transmitting scrub-typhus and other rickettsial diseases. Its 49 clear diagrams are easily comprehended even by those with little special training in entomology, and the book should be of considerable help to isolated workers. Unfortunately by the time it was issued some sections were already out of date. War secrecy regulations prevented the inclusion of control measures. Many very recent publications have cleared up the vector question. We hope that a new edition will soon follow this one: it will be even more widely welcomed.

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THE LANCET

LONDON: SATURDAY, JUNE 15, 1946

Penicillin in Osteomyelitis

AMONG the earliest cases treated with systemic penicillin at Oxford were examples of staphylococcal bacteræmia associated with osteomyelitis. Sir HOWARD FLOREY and his colleagues showed not only that the blood could be sterilised, thus saving life in some 25% of cases, but that when diagnosis was prompt and treatment was begun without delay the cocci within the bone were also destroyed so that complete resolution could take place. When treatment is delayed, the blood-supply to a comparatively large area may be cut off, and it may then be impossible for the drug to reach the staphylococci in effective concentration. A heavy responsibility therefore rests on the general practitioner; though he rarely meets with the condition he must bear it in mind and must be able to recognise the diagnostic area of acute tenderness on the bone, remembering that more than one lesion may be present and that a history of pain shifting from one area to another is not unknown in osteomyelitis. Once the diagnosis is made the patient must be transferred without delay to hospital, since experienced surgical assistance and nursing are essential.

The management of these cases in hospital was discussed at the Royal Society of Medicine [1] on Feb. 5 by VAUGHAN HUDSON, E. C. B. BUTLER, and JOSEPH TRUETA, and AGERHOLM and TRUETA describe their results in this issue. Blood-culture, both qualitative and quantitative, should be included in the preliminary examination, since without it there may be no means of ascertaining the nature of the causative organism or its sensitivity to penicillin. The Oxford surgeons began by giving systemic penicillin at the rate of 100,000 units a day but later increased this to 400,000 units at the beginning of treatment, falling back to the original dose as the condition improved. They justify this on the theoretical ground that the higher concentrations obtained in the blood will be bactericidal as well as bacteriostatic, but it is perhaps more likely that the raised level in the blood will enable the drug to penetrate small areas in the bone where the blood-supply has been cut off. In their series the duration of treatment was relatively short —six to fourteen days—whereas BUTLER, still employing a dosage of 100,000 units a day, maintained that treatment should be continued for two to three weeks. VAUGHAN HUDSON also found it advisable to increase his three-hourly doses from 20,000 to 60,000 units. If the higher dosage makes it possible to shorten the course, this will be a welcome advance, for a nervous child soon comes to dread the sight of the needle. AGERHOLM and TRUETA use an intramuscular drip which minimises the number of needle pricks, but it increases the risk of infection with gram-negative bacilli and necessitates immobilisation of a limb. The three-hourly injection can be dissolved in a small volume and injected through a hypodermic needle. In treating a child both methods should be available. Before long a completely satisfactory vehicle may be found which will release the drug slowly after single injections of high dosage, and with the purer preparations of penicillin now obtainable the reactions described by AGERHOLM and TRUETA should become increasingly rare. Little attention was paid to the local use of penicillin by any of those taking part in the R.S.M. discussion, VAUGHAN HUDSON even regarding it with disfavour.

With regard to the need for surgical intervention in the acute stage, AGERHOLM and TRUETA report that cases which reached them before pus was present required only systemic penicillin and immobilisation; with adequate dosage resolution appeared to be complete and the patient might leave hospital in three weeks. But when this form of treatment was adopted in 2 of their early cases, in which abscesses were present on admission to hospital, the general symptoms were slow to subside and the local swelling persisted; later radiograms showed a spreading decalcification of the bone, and pus was eventually aspirated which contained living staphylococci. Since then AGERHOLM and TRUETA have made it a rule to operate in such cases, evacuating all pus and drilling the bone to relieve tension. They soon found that primary suture could safely be performed because no further pus was formed provided the infecting organism was sensitive and the dosage of penicillin adequate. If the presence of an abscess was doubtful, re-examination next day would reveal either notable local and general improvement or definite signs of pus. By combining systemic penicillin with surgery they prevented the later spread of infection, because the bone was in fact sterilised. Whether this can always be achieved seems doubtful, but the Oxford surgeons can contrast their results with those reported elsewhere in which surgical interference was reduced to a minimum. Their thesis is in line with the fact, well recognised in other infections responding to penicillin, that the drug cannot be relied on to sterilise the contents of an abscess. VAUGHAN HUDSON, using conservative treatment, also reported complete cures, but more often a condition resembling chronic osteomyelitis resulted. He also successfully used primary suture under cover of penicillin after operations involving the bone done to prevent infection spreading to vital organs, and had least success with extensive operation wounds left open for drainage. In general he took a cautious view of penicillin therapy in acute osteomyelitis because of the well-known vagaries of the disease. BUTLER, like the Oxford workers, was accustomed to open abscesses and drill the bone when there were signs of tension, but he mentioned some cases which proceeded to extensive decalcification although there had been no indication of an abscess. Further experience is needed to show what the ultimate effect of early drilling of the bone will be in such cases. There was no mention at the R.S.M. of further metastasis occurring after the institution of penicillin treatment, but such lesions may not become apparent until long after the original invasion of the blood-stream, so it is not yet safe to assume that they will be prevented in all cases.

In chronic osteomyelitis the infecting organisms are established in dead or sclerosed bone or in scar tissue, where the blood-supply is either non-existent or scanty, so that systemic penicillin cannot be

1. See *Lancet*, Feb. 16, 1946, p. 236.

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expected to reach them in sufficient concentration to destroy them. HEBB,[2] treating 17 cases with systemic penicillin alone, found that the treatment reduced the discharge from existing wounds or sinuses but that the discharge always recurred when a sequestrum or cavitation in the bone was present. He quotes, however, 5 cases, unsuitable for operation, which derived real benefit from the treatment. The main function of penicillin in chronic osteomyelitis is to protect fresh tissues exposed to infection during operation. In this respect the experiences reported by HEBB and by KEIR [3] last week are impressive, though years must pass before the final results can be assessed. Of KEIR's 26 cases, 23 were soundly healed in an average period of seven weeks from operation, his only failures being 3 cases in which insensitive staphylococci were present. His operations are designed to remove all dead bone and infected granulation tissue, and he protects the exposed living tissue with penicillin solution passing by rubber tube to the depths of the wound, which is otherwise sutured. Such operations leave a considerable cavity which becomes filled with blood-clot, and a high concentration of penicillin is needed to prevent further infection. Systemic penicillin is used as and when the severity of the condition demands it. KEIR also cites methods of dealing with insensitive bacteria remaining after the cocci have been eliminated. HEBB, who seems to rely mainly on systemic penicillin, claims success in 43 out of 52 cases coming to operation. He employed primary suture in only 11 cases. Comparison of the two papers suggests that success largely depends on the maintenance of an adequate concentration of penicillin in the wound cavity during the week after operation.

Mother Earth

THE absolute dependence of animals and man on plant life must have been obvious to farmers for thousands of years. In the past century urban communities have almost forgotten that the regular appearance of bread, meat, and milk on their tables depends on successful harvests and animal husbandry. But today we are again conscious of these elementary facts. "Freedom from want" cannot be achieved simply by political and economic manipulation, nor by refrigerators or any other product of modern industry. It must be founded on the efficiency and ability of those who work on the land.

During the 18th and 19th centuries a stable and efficient system of agriculture was built up in Great Britain based on the "Norfolk, or four-course rotation" of crops.[4] Increasingly during the 19th century, however, farmers overseas were ruthlessly exploiting the stored fertility of their virgin soils, with the eventual result that thousands of square miles of soil were impoverished or destroyed. General condemnation of this kind of exploitation has now given rise to a somewhat emotional reaction against modern agricultural methods, particularly against the use of "artificial" fertilisers, which are supposed to ruin the land and the crops grown on it. But this attitude generally ignores the basis of our nutrition. The earth's crust, after all, consists primarily of rock, containing the same chemicals as those in artificial manures, and from these simple chemicals plants synthesise the more complex organic molecules essential to the life of animals.

The fertility of the soil is governed both by its chemical content and by its physical properties, which determine its power to retain water and oxygen. These physical properties depend partly on the type of rock from which the soil was formed but also largely on its content of humus or organic matter. Lately a number of societies have sprung up to advocate the wider use of compost, a material made from animal excreta and vegetable residues, in place of artificial manures. All will sympathise with the desire of the reformers to achieve a stable agriculture and adequate health and nutrition for mankind, but it must be admitted that many of the statements made in preaching this new gospel are unacceptable both to the scientist and to the practical farmer. Thus we read that "right up to the year 1840 when Liebig first started his chemical campaign [Nature] successfully managed to feed the world's populace with an abundance of healthy nourishing food." [5] Surely it is generally recognised that there was often privation and starvation before that date. Though Sir ALBERT HOWARD [5] quotes Lord ERNLE with approval and points to the example of COKE of Norfolk, he appears to have overlooked ERNLE's verdict in *English Farming Past and Present* that "it is to the great German chemist Liebig that modern agriculture owes its most striking development" and that much of COKE's success was due to his application of marl (lime) to the soil. Even today fields on COKE's estate containing marl-pits are seldom deficient in lime. The pamphlet *Mother Earth*, introducing the Soil Association inaugurated on May 30,[6] is more moderate in tone, but its authors lay themselves open to similar objections. "All artificial things," Dr. SCOTT WILLIAMSON says, "are invented, and all are 'made' by man. All natural entities are born, and all are grown by Nature." But are not lime, rock phosphate, and nitrogen natural entities? Nitrogen fixed by the nitrifying bacteria of leguminous plants is apparently regarded as beneficial, but not nitrogen supplied as nitrates: it is as if a physician with no milk or vegetables for children under his care refused to give them ascorbic acid, synthetic vitamin D, and calcium salts. The case for the use of artificial manures is forcibly, though no doubt inadvertently, presented in the remark that a cow giving 600 gallons of milk secretes in a year the equivalent of just over 1 cwt. of chemical fertiliser in her milk.[5] Normally this milk goes off the farm, and no amount of compost made from materials on the farm can replace these chemicals.

More difficult to assess is the argument that animals and man are now much more disease-ridden than formerly and that disease could be almost eliminated if we ate food grown on naturally manured soil whose flora and fauna had not been upset by artificial additions. The Registrar-General's figures, however, do not support the view that disease is much more prevalent now than formerly, and there is certainly

2. Hebb, H. D. *Canad. med. Ass. J.* 1946, **54**, 446.
3. Keir, D. M. *Lancet*, June 8, 1946.
4. This system is not necessarily efficient under the conditions now prevailing. See *Mixed Farming and Muddled Thinking*, by Viscount Astor and B. Seebohm Rowntree, London.
5. *Soil and Health.* (Edited by Sir Albert Howard.) Vol. 1, no. 1, February, 1946.
6. The offices are at 8F, Hyde Park Mansions, London, N.W.1.

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no reason to think that communities living on "natural" diets are particularly resistant to such infections as tuberculosis, influenza, and measles. Over the period 1885–1936, during which time artificial manures came into general use, the average yield per acre from all agricultural land in Great Britain increased by over a third. For a hundred years experiments have been carried out at Rothamsted in which various plots of land, growing wheat, have been treated with artificial manures on the one hand, and farmyard manure on the other. Reviewing these experiments together with other evidence, Sir JOHN RUSSELL [7] said that no organic manure had yet been found in which the nitrogen had a higher value than in nitrate of soda. While freely admitting the value of humus for improving the physical condition of the soil, he could find no evidence that organic manures have any *special* virtue either in increasing soil fertility or in improving the health or feeding value of the crops. In practice farmers seem to obtain their best results by using a combination of farmyard manure and inorganic fertilisers. A great disadvantage of farmyard manure and "compost," however, is the expense of handling them, and it is being increasingly realised that humus can be obtained more cheaply from grazing animals, and by ploughing-in sod and foliage of grasses, clovers, and other crops.

While we strongly welcome these signs of renewed interest in the soil and its care, we hope that the new association will concentrate rather on investigation than propaganda. Whatever LEWIS CARROLL may have said, statements cannot be made true merely by repetition.

Annotations

DIPHTHERIA IMMUNISATION SURVEYED

THE Minister of Health is continuing the campaign for diphtheria immunisation, and has appealed to local authorities to immunise as many children as possible before the autumn.[8] An inquiry into diphtheria immunisation made for the Ministry by the Social Survey shows that, good as the publicity campaign has been, there are still parents whom it has not reached, and a few who are prejudiced against immunisation. A full report [9] of the inquiry, by Kathleen Box, shows that 2000 mothers of children aged less than sixteen in England and Wales were interviewed, and that 81% of these who had children over the age of one year had had at least one child immunised—a higher proportion than in any previous year. In all, about 67% of children under sixteen had been protected. Of children under five about half, and children under two about a fifth, had been immunised, and there were no considerable differences for town and country children. In the North of England the proportion was relatively low, being 59% as compared with 70% elsewhere. Children coming from families with better education and higher income were more often immunised, but the differences were not great.

Only 24% of mothers knew that diphtheria was an infectious disease: 23% thought it was due to bad drains or dirt, and the rest said they did not know its cause or gave other answers; yet this ignorance has not prevented most of them from having children immunised. Mothers living in small towns and in the country were on the whole better informed than mothers living in large towns. Mothers had learned about immunisation from newspapers or magazines (75%), over the radio (50%), at cinemas (40%), or from posters (87%). Most of the children had received their treatment under the Ministry's free scheme, only 16% being immunised by private doctors. In 19% the arm was said to be painful after injection, but those experiencing this trouble were not deterred from having the second injection. Of the immunised children, 34% were protected at the suggestion of the school, 19% at the suggestion of the clinic, and 6% and 5% at the suggestion of health visitors and doctors; 35% of mothers had had children protected on their own initiative. Among interviewed mothers who had not had their children immunised, only 15% said they did not believe in it; 26% said the husband objected or that the child would be frightened. The largest group of unprotected children (amounting to 35% of the whole unprotected group) was accounted for by apathy or ignorance on the part of the mother.

Some samples were deliberately taken in areas—some good, some bad—which had been well investigated in 1942. There has been an increase in the proportion of children protected in both the good and the bad areas, but greater in the bad areas, since 1942; but the proportion of protected children in the younger age-groups is still lower in the bad than in the good areas. On the whole the survey shows growing public recognition of the value of diphtheria immunisation; but there are still some 3 million unprotected children in the country, and the number of cases and deaths have increased this year. The Ministry believe that if three-quarters of the child population can be protected, diphtheria as an epidemic disease will be defeated. If a determined drive is made it should be possible to reach this target before the winter.

EMOTIONAL TEASERS FOR THE ORTHOPÆDIC SURGEON

"ORTHOPÆDIC surgeons," says Luck,[1] "have to come to the realisation that there is a psychiatric aspect to their work which they can neither ignore nor deal with merely by intuition." Emotional factors, for example, play a considerable part in the production or perpetuation of backache. Sargent [2] has found this symptom common in a neurosis centre for anxious and exhausted air crews, and less than 4% of his cases had any organic orthopædic disease to account for their pain. In many the backache was of a hysterical conversion nature, and could rarely be put down to the prolongation of symptoms of some previous injury or disease. The somatic manifestation commonly served an immediately useful purpose by taking the place of overt anxiety, and in some patients the two seemed to alternate. By far the largest group were cases of operational fatigue, with combat fears and general restlessness; here the backache was due to muscular tension resulting from severe nervous strain. The spasm was often severe, even board-like, with continued fibrillation even in relaxation; the severity of the pain on waking in many of these cases probably arises from tense insomnia and anxiety dreams. The back muscles are then constantly fatigued, and any slight additional burden produces pain, which, unlike the sharply localised symptom of the conversion hysteric, is typically diffuse. The results of treatment were not always very satisfactory, even with combined orthopædic measures and superficial psychotherapy. In the conversion group local physical treatment is to be avoided since it focuses the patient's attention on his back; and even for those with unremitting spasm long-

7. *Scottish J. Agric.* 1939, **22**, 1.
8. See *Lancet*, April 6, p. 523, and May 25, p. 803.
9. The Social Survey Report, New Series, no. 69. October, 1945. Obtainable from the Ministry of Health, Whitehall, London, S.W.1.

1. Luck, J. V. *J. Bone Jt Surg.* 1946, **28**, 213.
2. Sargent, M. *New Engl. J. Med.* 1946, **234**, 427.

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continued physiotherapy is inadvisable. For this type of case psychotherapy was the main line of approach, preceded by a simple explanation of the relation of muscular to mental tension and the need for relaxation.

From the viewpoint of the orthopædic surgeon psychogenic conditions may be based on an organic lesion, may perpetuate the symptoms of a healed organic lesion, or may be quite independent of any physical disease. The psychiatrist may look on these cases as examples of conversion hysteria, anxiety state, or the elaboration of physical symptoms; and these types may be combined. Luck has surveyed 1000 cases referred to the orthopædic service of a military hospital, in whom musculo-skeletal symptoms were entirely or principally emotional in origin. Not all of his patients could be classified as definitely psychoneurotic. Most were simply instances of adult maladjustment, and of the frank neurotics the bulk were cases of conversion hysteria; only a few had pure anxiety states, and compulsive neurosis and neurasthenia were only occasionally encountered. Psychogenic pain in the back or limbs often took the form of feelings of tension or pressure which were unrelieved by immobilisation and might radiate proximally from some distal point like the coccyx; bizarre postures were sometimes adopted for its relief. One of the commonest signs, which was often overlooked even by the patient, was a circumferential, non-anatomical hypoalgesia of which the classical glove-and-stocking anæsthesia is a variety. The particular pattern of sensory disturbance was not often dictated by the site of subjective musculo-skeletal pain; it usually remained pretty constant for several weeks, and involved the deep ligamentous and tendinous structures as well as the skin surface. Of 100 patients with this hypoalgesia, all four extremities were involved in 72. In the 10 patients with hysterical paralysis this always coincided with the site of subjective pain and usually with the area of blunted sensation. There was a noticeable tendency for unilateral features to be right-sided.

Luck emphasises the practical duties of the orthopædic surgeon in dealing with these patients, who are too numerous for them all to be handed over at the outset to the psychiatrist. It is possible for any clinician to make a brief neuropsychiatric examination in a few minutes, and many of these patients benefit from a similarly superficial psychotherapy, though here it is usually advisable to call in assistance. The aim of such treatment is to settle environmental difficulties, give some insight into the nature of the symptoms, identify and eliminate where possible any underlying conflicts, and provide sedation and occupational therapy.

RADIOGRAPHY OF THE SPLEEN

THE shadow cast on an X-ray film by the spleen is usually obscured by that of the opaque food in the stomach and intestine. If, however, a film is exposed with suitable standard technique, preferably with the stomach empty, the lower part or even the whole of the spleen outline can often be traced. Many palpable spleens are not enlarged, while on the other hand many enlarged spleens are not palpable. There appear to be few criteria of the value of the information that can be obtained from an X-ray film in this respect, and in order to establish satisfactory radiological data a series of studies has been made by Major Dell and Captain Klinefelter.[1] Three hundred cases of suspected or known splenic enlargement were examined, in half of which the spleen was palpable. In determining the size of the spleen, the outline of the kidney should form a useful comparison, particularly if both organs are visible in their entirety. The investigators' conclusions are that the spleen is not enlarged if it is not "visualised," if it is not more than 5 cm. in width, and if it is not more than 85% the size of the kidney—this last figure representing foreshortening owing to the spleen being further from the film: they suggest that by producing a pneumoperitoneum, renal and splenic outlines could be made more apparent.

Whether or not the accuracy of results obtained by present radiological technique (admittedly not yet on a sound basis) would justify the induction of pneumoperitoneum is problematical, but the routine recording of the splenic size in relation to that of the kidney seems to be so simple that, with experience, it might well be of clinical value.

1. Dell, J. M., Klinefelter, H. F. *Amer. J. med. Sci.* 1946, **211**, 437.

TREATMENT OF AGRANULOCYTOSIS

"DEATH in agranulocytosis," says Dameshek,[1] "probably is not due to the lack of granulocytes as such but to the bacteremia and septicemia which inevitably ensue. . . . The period during which the blood and tissues are depleted of granulocytes is a critical one. It is during this time that generalised sepsis may occur. The patient thus may die of sepsis during spontaneous bone-marrow recovery." There is, however, no very clear evidence that such sepsis does occur in agranulocytosis; on the contrary, the local lesions are often astonishingly free from pathogens, and a positive blood-culture is rare. Dameshek treated agranulocytosis with sulphonamides, which, in view of their known propensity for causing the disease, was perhaps not a very happy choice. Penicillin seemed to be the answer, since it does not depress granulopoiesis, and there have now been several enthusiastic reports of its value; but, in spite of their acceptance of the sepsis theory, few workers have been willing to place their trust in penicillin alone. Thus Sprague and Ferguson[2] had a case of sulphonamide agranulocytosis with massive abscesses; penicillin was given and was credited with the recovery, but the patient also had blood-transfusions, pentose nucleotide, yellow bone-marrow, and liver intramuscularly. Smith, Cohen, and Nichols[3] had 2 cases following mapharsen, and Boland, Headley, and Hench[4] a case following gold therapy for rheumatoid arthritis; all these patients received multiple treatment. Even Dameshek and Knowlton[5] treated a case of sulphonamide agranulocytosis with transfusion as well as penicillin; and there are other similar reports of multiple treatment in which the credit is given to penicillin for no better reason, it seems, than that it is the latest on the list.

Tyson, Vogel, and Rosenthal,[6] in the first number of a new journal, *Blood*, report a more careful study. They had 9 cases of thiouracil agranulocytosis, of which 4 were fatal and 5 recovered. The only positive blood-culture occurred in the fatal group, the organism being a somewhat resistant *Streptococcus viridans*. Of their recovered cases, 3 had blood-transfusion and liver extract, but no pentose nucleotide, as well as penicillin; but 2 actually had only penicillin in relatively small amounts of 10,000–15,000 units 3-hourly. The evidence for the value of penicillin in agranulocytosis is thus not very convincing, and already the next "newest" rival has appeared. Cantor and Scott[7] report good results with pyridoxine, a member of the vitamin-B complex; the hydrochloride was given intravenously in doses of 125–200 mg. daily to 3 cases, but 2 of these had also received blood-transfusion.

Clearly no specific for agranulocytosis has yet been found. The search is likely to be difficult with a disease

1. Dameshek, W. Leukopenia and Agranulocytosis, Oxford, 1944.
2. Sprague, H. B., Ferguson, L. K. *U.S. Nav. med. Bull.* 1944, **43**, 1014.
3. Smith, L. B., Cohen, F., Nichols, R. G. *J. Amer. med. Ass.* 1944, **126**, 1027.
4. Boland, E. W., Headley, N. E., Hench, P. S. *Ibid*, 1946, **130**, 556.
5. Dameshek, W., Knowlton, H. C. *Bull. New Eng. med. Center*, 1945, **7**, 142.
6. Tyson, M. C., Vogel, P., Rosenthal, N. *Blood*, 1946, **1**, 53.
7. Cantor, M. M., Scott, J. W. *Canad. med. Ass. J.* 1945, **52**, 368.

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that, despite all the new methods of producing it—sulphonamides, thiouracil, gold, and the like—is still far from common, and whose course is either death or rapid spontaneous recovery. It would be a brave man who would withhold transfusion or pentose nucleotide in a case that is not doing well, since these are the only two measures which are of value, however slight. But if sepsis is present, penicillin has its place as an antibacterial drug without depressant effect on the formation of granulocytes.

FELLOWSHIP IN ADVERSITY

A COMMON dislike is said to be a great bond, but a common ailment runs it close. The Diabetic Association are an old-standing example of those whose disability has brought them together, to share experience, pass on tips, and give each other whatever help lies in their power. They were followed, in 1935, by the body now called the American Epilepsy League, which welcome not only epileptics but all who are interested in suppressing the disorder. In 1939 the Infantile Paralysis Fellowship was established, with the objects of associating victims of poliomyelitis, encouraging them to develop their interests and abilities, to find means of training and re-educating members for occupations in which they can support themselves, to enable the less severely disabled to help those who are worse off, to alleviate loneliness, and to keep the public in touch with the difficulties of the paralysed. The 700 members, among whom a bulletin circulates, enjoy sharing their interests, and learn through the fellowship of jobs which they may be able to undertake. The executive committee, nearly all of whom have experienced the disease, ask doctors to bring the fellowship to the notice of any poliomyelitis patients they may be treating. The address is 18, Nassau Street, Mortimer Street, London, W.1.

PROGNOSIS IN ANGINA PECTORIS

FROM the wealth of carefully documented clinical material in the Mayo Clinic, Willius and his colleagues [1] have produced the most statistically satisfactory study so far published of the survival-rate in angina pectoris. Their figures are based on 3440 cases seen at the clinic during the ten-year period 1927–36, all of them followed up for at least five years. The male : female ratio was 4·3 : 1. The average age of the patients at the time of onset of the angina was 57·1 years, 88% falling in the age-group 40–69 years. Only 125 patients (3·6%) were under 40, and 276 (8%) were 70 years of age or older.

Only 10% of the female cases were in the 40–50 age-group, whereas 55% were in the age-group of 60 years and older, compared with 46% of the men. This last observation fits in with the general impression that coronary disease manifests itself at a later age in women than in men. The highest mortality occurred during the first year after diagnosis, when the rate was 18%. From year to year thereafter the mortality was fairly constant at about 10%. Survival-rates were consistently higher for women than for men—thus at five years from the time of diagnosis the survival-rate was 71% for women and 58% for men, while at ten years the rates were 49% and 33%. The average five-year-survival rate for the entire series was 53%. There was no evidence to support the general belief that angina pectoris in younger patients carries a relatively good prognosis.

The five-year-survival rate of patients who had no clinical or radiological evidence of cardiac enlargement was 62% compared with 39% for those with cardiac hypertrophy. Hypertension also exerted an adverse effect on prognosis, the five-year-survival rate for those without hypertension being 61% compared with 46% for those with hypertension. The prognostic value of ophthalmoscopic examination in hypertensive subjects was strikingly corroborated. Among the 499 patients classified as group I according to the state of the retinal vessels, the five-year-survival rate was 52%, compared with 42% for the 279 patients in group II and 16% for the 55 in group III. Congestive heart-failure caused the five-year-survival rate to slump to 16%, the corresponding figure for all cases of congestive failure, regardless of ætiology, being 30%.[2] Analysis showed that, used with discrimination, the electrocardiogram can be a help in prognosis. The five-year-survival rate for those with normal electrocardiograms was 70%; for those with significant T-wave negativity, or Q-changes, or both, it was 43%; and for those with conduction defects it was 35%. The lowest five-year-survival rate of all (17·5%) was in those with auricular fibrillation, but the smallness of the group (57) reduced the significance of this observation.

We can thus assure our patients that the prognosis of angina pectoris is not such a gloomy one after all. Five years from the time of diagnosis more than half the patients with angina pectoris will still be alive, while after ten years a third of the men and half the women will still remain.

WAR ON THE WEED

A PROMISING development of the war-time study of regulators of plant growth is their application to the eradication of weeds from useful crops. The Bureau of Plant Industry of the United States Department of Agriculture, with members of the department of chemistry of Ohio State University,[3] tested over 1000 derivatives of phenoxyacetic, benzoic, naphthoic, phthalic, sulphamic, carbamic, cinchonic, and picolinic acids, and other compounds, from this aspect. Their activity was first assessed by measuring their inhibition of elongation of the root of the germinating corn seed and of tissue production by red kidney beans. Any inhibition observed was then compared with the inhibition caused by the plant-growth regulator, 2, 4-dichlorophenoxyacetic acid ("2, 4 D"). Compounds which gave the best results were then tried in greenhouses and in the field. It was found that the herbicide compounds were many times more effective when they were applied in aqueous or non-aqueous sprays than when they were applied as solids. Comparatively low concentrations applied to the soil prevented seeds from germinating. Some of the compounds tested were difficult to dissolve, but tributyl phosphate was found to be the most satisfactory co-solvent for making high concentrations of the herbicide in oil. The carbo-waxes (polyethylene glycols) were suitable co-solvents for making aqueous solutions and they also acted as spreaders (wetting agents).

The compound 2, 4 D did not persist in soil for longer than 80 days. Heavy rainfall did not lessen the efficiency of herbicides dissolved in oil, but 24 hours of rain seriously reduced the activity of those dissolved in water. The action of 2, 4 D is rapid; on warm sunny days plants sprayed with it may show stem curvature and inrolling of the leaves within an hour. The compounds tested were, in general, more toxic to broad-leaved plants than to grasses, but derivatives of carbamic acid, and especially isopropylphenylcarbamate, were more toxic to cereals. Among broad-leaved plants only one instance of specific action was observed, 2, 4–5-trichlorophenoxyacetic acid and its derivatives strongly inhibiting Irish potatoes, on which all other phenoxyacetic acids had little effect. Work in Porto Rico showed that neither sugar-cane nor coffee plants were affected by 0·3% sprays of 2, 4 D, but that many of the most injurious weeds of these crops are very susceptible to it. Thus one treatment with a 0·05% spray at the rate of 50 gallons per acre

1. Parker, R. L., Dry, T. J., Willius, F. A., Gage, R. P. *J. Amer. med. Ass.* 1946, **131**, 95.
2. Dry, T. J. *Ibid*, 1942, **118**, 263.
3. *Science*, April 19, 1946, p. 472 et seq.

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(the chemical alone cost 50 cents per acre) sufficiently controlled commelina, one of the worst weeds, and also *Pica pica*, which is dreaded because of its stinging hairs. Other weeds were just as sensitive, while yet others were less so but could be controlled. While the conventional weed-killers burn the foliage and act rapidly but do not damage the growing point sufficiently to prevent regeneration, 2, 4 D destroys the growing regions within a few weeks.

In the U.S.A. ragweed is looked on as the most common cause of pollen allergy, and it was found that 2, 4 D would prevent the shedding of pollen by the eastern species of ragweeds provided it was sprayed on early enough in the development of the flower. Application with a "fog machine" was quick and cheap, and avoided the use of large quantities of water. The Japanese water hyacinth, *Eichornia crassipes*, which was imported from Japan to South America and from Venezuela to Florida, where it chokes waterways, could also be controlled with 2, 4 D, and no injurious effects on aquatic animals were observed. Finally, 2, 4 D looks like being useful for killing seeds of weeds in manures used as top dressings for lawns, gardens, and tobacco plantations.

MALNUTRITION IN GERMANY

SPEAKING of the present state of Germany in the House of Commons on June 5, Mr. Churchill said: "The idea of keeping scores of millions of people hanging about in a subhuman state between earth and hell, until they are worn down to a slave condition, or embrace Communism, or die off from hunger, will only, if it is pursued, breed at least a moral pestilence and probably an actual war." Few would disagree with this, or with his view that neither we nor the United States can afford to let chaos and misery continue indefinitely in our zones of Germany: either we should get the food for the Germans for whom we are responsible or should take the best measures to enable them to earn their own living. Hitherto the main disagreement has been on the extent of Germany's need. Up to this spring the average daily ration in the three western zones of Germany produced 1550 calories, but this could be supplemented to an unknown and no doubt variable extent by unrationed foods, family stocks, and the black market. At the beginning of March the standard ration in the British zone was reduced to the equivalent of 1000 calories daily, and a natural effect of this reduction was to cut down the amount of supplementary food coming into the towns. Moreover, by now, household stores are likely to be low or non-existent. Civilians in the British zone would therefore be expected to show signs of malnutrition, at any rate in the towns, since, as Sinclair [1] has emphasised, "even for a man continuously at rest in bed, a daily intake of food providing only 1000 calories represents definite starvation." However, there has remained the possibility that the Germans are obtaining off-the-ration foods in unofficial ways, and when British civilians are being threatened with bread rationing and faced with the prospect of a serious reduction in feeding-stuffs for cattle, pigs, and poultry, there is an obvious need for a nutritional survey of the German population to convince us of the extent of their sufferings. This has now been done.

The survey has been made by a committee of British, American, and French nutritionists, headed by Sir Jack Drummond, Colonel W. L. Wilson, and Inspector-General G. Coulon,[2] in Hamburg, Hanover, Düsseldorf, Essen, Bremen, Kassel, Stuttgart, Coblenz, Saarbrücken, Dreudenstadt, and Schramberg. Their report has so far been issued only in Berlin, but summaries have appeared in the daily press.[3] In children up to 6 years there is as yet no evidence of inadequate calorie intake, but vitamin B and iron intakes are low, and rickets and nutritional anæmia are increasing. In older children and adolescents shortage of food is showing itself in retarded growth; deficiencies of vitamin A, riboflavine, and ascorbic acid are common, and anæmia is increasing in this group also. In adults malnutrition is appearing particularly in the aged and unfit, and famine œdema, after almost disappearing during the winter, is becoming widespread in the towns.

"The first thing," said Mr. Churchill in the Commons, "is that the Germans should earn their own living." And the nutritionists report that the lowering of the rations will reduce productive output and seriously retard economic recovery: "The present ration scale is resulting in a decline of physical strength, increased absenteeism, and discontent among workers generally." On these grounds alone every practicable step should be taken to raise the rations once more to 1500 calories as a minimum, remembering that even this will not keep people healthy over a long period. Raising the rate of extraction of our flour to 90% (it is 100% in Germany) and reducing the amount of grain used for feeding our stock are two of the practicable steps which seem unavoidable. But one can sympathise with the farmers [4] who ask for an assurance that the burden is being shared by other supplying countries.

1. Sinclair, H. M. *Times*, April 25, 1946, p. 5.
2. Assisted by Dr. H. M. Sinclair and Mr. J. B. Lockwood (Great Britain), Colonel W. M. Sebrell and Lieut.-Colonel W. F. Ashe (U.S.A.), and Dr. G. Pierren and Lieut.-Colonel M. Roche (France).

AT the Nuffield Institute, Oxford, at 5 P.M. today, Friday, June 14, Dr. Wilder Penfield, director of the Montreal Neurological Institute, will deliver a lecture on Psychical Seizures.

Dr. James Taylor, consulting physician to the National Hospital, Queen Square, died at his home in London on June 6, aged 87.

WE also regret to record the death, at sea on June 5, of Dr. H. G. Earle, former director of the Henry Lester Institute of Medical Research, Shanghai.

3. See, for example, *Manchester Guardian*, June 4, 1946, p. 5.
4. *Times*, June 7, 1946, p. 3.

CHEMICAL RESEARCH EXHIBITION

THE exhibition, "*Chemistry at Your Service*," organised by Imperial Chemical Industries Ltd. at 22, Lower Regent Street, London, is intended to bring home to the man in the street the achievements and potentialities of the chemical industry. It is open daily, including Sundays, until June 28, and the proceeds will go to the Imperial Cancer Research Fund. The exhibition will certainly awe the layman with its charts, illuminated sets of chemical apparatus, photographs of great men, and so on, though it may prove rather disappointing for the medical man hoping to see the modern advances in chemical research explained for him. Eight of the most useful and spectacular chemicals which I.C.I. have produced during the last few years form the basis of the exhibition—the drugs 'Paludrine,' penicillin, and 'Sulphamezathine'; the weed-killer 'Methoxone'; the insecticide 'Gammexane'; the plastics 'Perspex' and 'Polythene'; and the synthetic protein fibre 'Ardil,' made from groundnuts. In the medical section there is a corner exhibit on the production, testing, and clinical applications of penicillin. There are also charts on the synthetic production of sulphonamides, and charts and illustrations expounding the development of the antimalarial paludrine. The plastics section shows a few of the well-known surgical and dental instruments, in which perspex "pipes" the light round corners and bends to where it is required. Finally there is a "tree of diseases" with two branches on either side, one bearing leaves representing diseases for which chemical remedies have been found—e.g., scabies (benzyl benzoate), leishmaniasis (diamidines), pneumonia (sulphonamides)—while the other branch carries diseases ranging from psoriasis to carcinoma via poliomyelitis, filariasis, and the common cold, which remain to be dealt with.

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Special Articles

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

THE annual congress of this society, held in London from May 30 to June 1 under the presidency of Mr. CHARLES B. GOULDEN, was attended by nearly 250 people, including some 50 visitors. Some of these were distinguished foreign guests whom the society was delighted to welcome after seven years of compulsory isolation.

From the United States of America came Dr. Arnold Knapp (New York), who gave the Bowman lecture. France was represented by Dr. Mérigot de Treigny, hon. secretary of the French Ophthalmological Society. Prof. H. J. M. Weve, the official representative of Holland, was accompanied by Dr. E. C. Gravemeyer, of Amsterdam. Belgium's official guest, Dr. L. Coppez, was supported by Dr. L. Bauwens, Madame Van Boven, and Dr. C. L. Schepens. Switzerland sent Prof. B. Semadini, with Dr. A. Franceschetti and Madame Noëlle Chomé. Poland was represented by Dr. W. H. Melanowski, Norway by Dr. H. Gjessing, Sweden by Dr. Gunnar von Bahr, and Chile by Dr. Miguel Millan.

In his address of welcome the president referred hopefully to the prospect of an international congress being held in Europe in 1948.

The subject of Mr. Goulden's presidential address was the work of Johannes Evangelista Purkinje, that versatile genius who illuminated so many fields of human activity. Mr. Goulden reminded his listeners that Purkinje was born of poor Bohemian parents in 1787, and that, abandoning his training for the priesthood, he went to study medicine in Prague. Like many other eminent discoverers before and since that time, he failed to obtain due recognition before his death, and his studies in clinical ophthalmology, written in ecclesiastical latin, were never widely circulated. Moreover he was long handicapped by lack of funds and proper equipment. Nevertheless he left his mark on the science of pharmacology, on the art of general medicine, and even on the study of finger-prints. Ophthalmologists remember Purkinje chiefly as the first great exponent of entoptic phenomena, but his name is further immortalised in the images of Purkinje which are formed by the mirror-effect of the anterior surface of the cornea and the front and back of the lens upon a source of light situated in front of the eye.

EFFECTS OF MALNUTRITION

Mr. HAROLD RIDLEY, opening a discussion on Ocular Disturbances associated with Malnutrition, described his experience among released prisoners in Rangoon, Singapore, and other Far Eastern centres. Many of the cases surveyed by him were suffering from other maladies, such as malaria and dysentery, as well as malnutrition, so the clinical picture showed wide variations. He emphasised the suddenness of visual failure in many cases, and the value of liver in the treatment of amblyopia associated with malnutrition. He frankly recognised the impossibility of drawing a sharp distinction between normal and pathological optic disks—slight relative temporal pallor being a physiological condition without precise limits. In his experience the remaining areas of the fundus were normal as a rule, but a few displayed macular lesions associated with obliterative changes in the arterial branches concerned. The characteristic field change was a scotoma implicating the central 3 degrees of the field. Peripheral constriction was not often demonstrated.

Air Commodore P. C. LIVINGSTON, the other opener of the discussion, was absent on overseas service, but selections from his paper were read by Mr. FRANK W. LAW, hon. secretary of the society. Air Commodore Livingston's observations were founded on R.A.F. prisoners returned from Japanese camps. Although many of them had been compelled to perform heavy work on a diet containing not more than a third of the calories necessitated by such occupation, yet only 200 (i.e., less than 7%) out of 3000 men suffered from visual defect. Partial optic atrophy, macular changes, and veiling of retinal vessels were the main ophthalmoscopic findings. Diagrams were shown to illustrate central and peripheral field changes. Only a minority of the victims showed any appreciable improvement in visual acuity on repeated examination, and Air Commodore Livingston stressed the fallacy of "scotomatous" readings. The patient, he said, may contrive to read more of the test-type letters by groping for them with the aid of eccentric vision, so that his performances at successive tests may lead to wrong conclusions by an unskilled observer.

Mr. T. KEITH LYLE, in observations on returned Far East prisoners, had seldom found any macular abnormality, and commented on the frequent lack of correspondence between the degree of optic-disk pallor and the severity of the visual defect. He also described fragmentation of the central scotoma during the period of recovery. Dr. HUGH STANNUS spoke from the standpoint of a physician concerned with the problems of tropical medicine, and dwelt on the difficulty of classifying nutritional neuropathy. Several speakers mentioned the development of a series of peripheral vascular arcades invading the cornea of patients suffering from riboflavin deficiency. Mr. H. M. TRAQUAIR uttered a note of warning against the frequent assumption that a central scotoma necessarily indicates retrobulbar neuritis. Prof. H. J. M. WEVE pointed out that, although he had found many examples of central scotoma among prisoners returning from Java, the same disability was conspicuously absent in the victims released from German camps, even though the latter included many instances of starvation. Therefore, he said, we must surely postulate factors other than malnutrition. Presumably some toxin peculiar to the East is associated with dietetic deficiency in the production of so-called nutritional amblyopia.

Major BROWNING insisted that the condition known as beriberi is a clinical hotchpotch, that tropical medicine is in a state of flux, and that his chief impression of ocular disturbances associated with malnutrition was their wide variability. Some suffered pain, others had none. The onset was rapid in some, slow in others. Retinal signs might be gross or scanty.

CATARACT

Dr. ARNOLD KNAPP, in his Bowman lecture on the Present State of the Intracapsular Cataract Extraction, began with a survey of the main historical facts. He referred in detail to the work of Smith, Barraquier, Elschnig, Sinclair, Mendoza, Verhoeff, Gradle, Arruga, Amsler, and others. Special attention was devoted to the selection of cases, and to the difficulties and complications likely to be encountered at operation. Each stage in the operative technique was carefully described, and the advantages of akinesia were analysed. Dr. Knapp insisted that it is imperative to proceed slowly and cautiously in doing an intracapsular extraction, that a clean section is essential, and that properly applied sutures encouraged rapid postoperative restoration of the anterior chamber.

Sir STEWART DUKE-ELDER and the PRESIDENT thanked Dr. Knapp for his authoritative survey.

AMBLYOPIA

Dr. C. L. SCHEPENS (Brussels) showed many carefully prepared charts to display central or paracentral defects of the visual field. He remarked that tobacco amblyopia was very rare in Belgium and Holland before the world war, and that the increased incidence of the malady during the German occupation was probably due not only to malnutrition but also to the inferior quality of tobacco smoked. Nicotine is largely oxidised in the preparation of good tobacco, but is abundantly present in "green" tobacco, especially in the home-grown varieties. One striking feature of war-time tobacco amblyopia, in Dr. Schepens's experience, was the lowered average age of the victims. He also noticed a higher proportion of fundus lesions and the prevalence of symptoms referred to other parts of the body, and went on to suggest that tobacco amblyopia is essentially a retinal disease, and that abnormal signs in the optic disks are seen only in advanced cases, whose retinal changes have become irreversible.

Dr. H. GJESSING reminded the society that tobacco amblyopia commonly arose in Norway during the 1914–18 war, when there was a scarcity of fats. Sir STEWART DUKE-ELDER stressed the relation of Dr. Schepens's communication to those on malnutrition, and mentioned the clinical picture of subacute combined

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degeneration that may follow severe gastric hæmorrhage. He postulated a degradation of metabolism in the central nervous system provoked by defect in certain substances such as vitamin B_2, and went on to suggest that many of the clinical conditions which tend to be discussed separately may be shown by the advance of knowledge to possess one common denominator.

WELFARE OF THE CORNEA

Mr. EUGENE WOLFF, speaking on the Mucocutaneous Junction of the Lid Margin, maintained that the location of this junction at the orifices of the meibomian ducts is of more than academic significance, and that this arrangement is in fact essential to the corneal welfare. According to Mr. Wolff the precorneal film consists of three layers. In contact with the cornea is a layer of mucus derived from the conjunctival goblet-cells, which he proposes to call collectively the corneal polishing-cloth. The middle layer contains the watery product of the tear-gland, including lysozyme, but Mr. Wolff stressed that this lacrimal secretion would be rapidly dissipated by overflow and evaporation were it not held in position by the "fly-paper" of the eye—i.e., the meibomian secretion. The latter not only acts as a thin protective pellicle on the surface of the globe but also forms a low wall along the margin of the lower lid, thus permitting a lacrimal reservoir to be maintained, unless the tears flow too abundantly. Mr. FREDERICK RIDLEY, however, urged that all the observed phenomena could more reasonably be attributed to surface tension resulting from condensation of large protein molecules.

OTHER COMMUNICATIONS

Among many other papers read at the meeting, which will appear in due course in the *Transactions* of the society, were contributions by Dr. A. Lowenstein on Eales' Disease, by Dr. I. C. Michaelson on Traversing Intra-ocular Foreign Bodies with Retinal Detachment, and by Dr. A. J. Ballantyne, the president-elect, on the Nerve-fibre Pattern of the Human Retina. Dr. W. H. Melanowski (Warsaw) gave a vivid review of the History of Ophthalmology in Poland, rapidly sketching the life and work of Vitello, Novicampius, Sirenius, Szikalski, Kamocki, Galezowski, and that prolific observer Wicherkiewicz. He also recalled the names of Johnston, who provided a link between Poland and Scotland, and Zieminski, who was working at Moorfields in 1888.

Mr. E. F. FINCHAM, who was introduced by the President, read a paper on Recent Developments in Artificial Eyes, devoting special attention to the accurate reproduction of iris texture. Dr. MARY CRIPPS described the Treatment of Traumatic and Inflammatory Lesions by X-rays and Short-wave Diathermy Combined. Mr. D. V. GIRI read a paper on the Technique of Intracapsular Extraction of Cataract with Retention of Conjunctival Bridge. Mr. T. W. LETCHWORTH gave an autobiographical sketch of Stereoscopic Vision in Monocular Aphakia, and Mr. A. SEYMOUR PHILPS showed some excellent pictures in a paper on Retinal Venous Changes in Diabetes.

On the second day of the congress a successful clinical meeting was held jointly with the section of ophthalmology of the Royal Society of Medicine. Thirty cases were shown, including a number of prisoners returned from Far Eastern camps. In the absence of Mr. P. H. ADAMS, president of the section, the chair during discussion of the cases was taken by Mr. F. A. WILLIAMSON-NOBLE.

SOCIAL OCCASIONS

Members of the congress met at dinner on May 30 in the library and council room of the Royal College of Surgeons.

Sir ALFRED WEBB-JOHNSON, P.R.C.S., proposing the toast of The Society, recalled the links forged by Bowman, the founder of the Ophthalmological Society, between ophthalmic surgery and the Royal College of Surgeons, and referred to the work of Cheselden. The President replied. Dr. Arnold Knapp and Air-Marshal Andrew Grant replied to the toast of The Guests, proposed by Sir John Herbert Parsons, F.R.S. Finally Sir Arnold Lawson, in proposing the toast of The President of the Society, dwelt on Mr. Goulden's quiet efficiency.

On May 31 the official guests from abroad dined with the council of the Faculty of Ophthalmologists in the hall of the Society of Apothecaries, where they were welcomed by the president of the new faculty, Sir Stewart Duke-Elder.

Normally there are two hon. secretaries of the Ophthalmological Society, but for the last six years Mr. Frank Law has undertaken the task singlehanded. Recently he has assumed the additional burden of the hon. secretaryship of the Faculty of Ophthalmologists. His efficient work in these capacities has been warmly appreciated by his ophthalmological colleagues.

WIDER ASPECTS OF RHEUMATIC FEVER

PROFESSOR RYLE'S ADDRESS TO THE ROYAL SANITARY INSTITUTE

SPEAKING to the section of preventive medicine of the Royal Sanitary Institute at its congress in Blackpool on June 4, Prof. J. A. Ryle (Oxford) suggested that all diseases of high incidence may be said to have a "social" as well as an "individual" pathology. The social pathologist is concerned with ultimate causes, and particularly with those environmental, domestic, occupational, economic, habitual, and nutritional factors without which the intimate (or specific) causal factors cannot find their opportunity. The methods of social pathology include (1) social postmortem examination by means of statistical analyses, (2) morbidity studies, (3) planned ad-hoc sociomedical surveys, and (4) social experiments.

Included under the title of rheumatic fever are the acute and so-called subacute rheumatisms of childhood, adolescence, and early adult life; juvenile chorea; and rheumatic carditis. Consideration of the incidence of rheumatic fever and its sequels is impeded by lack of morbidity figures; and present judgments must be largely based on mortality records, which cannot exactly reflect morbidity. Since the initial onset usually occurs many years before death, mortality figures do not provide accurate information about the distribution or secular trend or the possible social and environmental associations of the disease at its inception.

It has recently been estimated by various authorities that there are nearly 200,000 cases of rheumatic heart disease at all ages in this country, and that the annual deaths in England and Wales from rheumatic heart disease are in the neighbourhood of 16,000. Nearly all deaths from heart disease before the age of forty are a consequence of rheumatic carditis, which before the war accounted for 2% of all deaths in England and Wales and 10% of the deaths between five and forty-five. Estimates from hospital sources of the proportion of rheumatic children that develop heart disease have varied between 50% and 90%. Figures from the London County Council records showed that about 2·0% of the child population below the age of fifteen were suffering, or had suffered, from rheumatic infections; but for the same area it has been estimated that the incidence of rheumatic heart disease fell from 2% to 0·77% between 1926 and 1937.

The incidence of the disease and the deaths in the early acute phase are both declining. Hospital physicians of experience may agree that serious initial attacks have become more rare in their lifetime, but that valvular disease continues to complicate many of the less severe rheumatic episodes. Special facilities are still not sufficient for the needs of all the damaged hearts, the cost of the disease to the community is great, and the problem remains a large and serious one.

SPECIFIC FACTORS

Evidence is steadily accumulating that the *Streptococcus pyogenes* (or certain of its serological types) is the infective agent. Sore throats or other upper respiratory infections commonly precede the individual rheumatic attack; and epidemics of streptococcal sore throat in partially closed communities have often been accompanied or followed by epidemics of rheumatic fever with carditis in a proportion of the population at risk. Serological reactions in rheumatic children support the theory of an initiating streptococcal infection. There is growing evidence of the efficacy of the sulphonamide drugs when used prophylactically to prevent rheumatic recurrences, though they have no beneficial effect on the actual rheumatic attack.

There is also strong evidence to support consideration of the rheumatic attack as a specific response at a suscep-

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tible age in individuals with an inborn or acquired sensitivity to a common agent. As with other sensitisation phenomena, the rheumatic attack follows the throat infection after an interval of up to two or three weeks; and its articular and cutaneous manifestations, like those of serum-sickness, are transitory. On the one hand, the existence of rheumatic families, with the disease appearing in successive generations under differing circumstances of environment, and on the other hand, the fact that most children living under unfavourable conditions do not acquire the disease, would suggest that at the two ends of the scale there are two types that are more or less susceptible to infection, or more or less liable to develop a sensitised state in the presence of infection.

SEASON, CLIMATE, AND GEOGRAPHY

Primary and subsequent attacks of rheumatic fever are especially common in this country in the period October-March—the period in which respiratory-tract infections have their highest incidence. It has been stated that the disease is more common in northern than in southern climates, but the medical statistics of tropical climates are at present unsatisfactory. It has also been concluded from mortality statistics that there is a higher incidence of rheumatic heart disease in the western counties than elsewhere in England and Wales.

SOCIAL FACTORS

Physicians have long recognised that rheumatic fever and heart disease are less common among the well-to-do than among the working-class populations; and evidence has been repeatedly adduced to show that rheumatic heart disease is closely correlated with poverty or with the complex of adverse circumstances which accompany poverty. Mortality has been shown to increase on the whole with density of population, but depressed rural districts return rates as high as those from the worst of the big towns; and a subsequent rise in the mortality from rheumatic heart disease was shown to follow the economic slump of 1930–32. Of the factors operating within the framework of poverty, damp houses have often been suspect, but crowding, with its increased liability to droplet infection, would seem to be more definitely incriminated. Nutritional deficiency has naturally been suggested as a further factor dependent upon the low economic status, but the evidence is inconclusive.

If, as is now generally accepted, droplet infection with the streptococcus is an important specific factor, local epidemics might be expected to occur among boys or girls or young adults, otherwise well cared for, but subjected to overcrowding. In fact, local epidemics have occurred in training ships and in barracks, where other influences were not unfavourable, except, usually, for damp and chill. But if damp and chill are potent factors, why was rheumatic fever so rare in young soldiers during the trench warfare of 1914–18? Rheumatic fever has had a low incidence in British public schools, but two outbreaks of streptococcal sore throat have been reported at such a school, where the hygienic arrangements were satisfactory except from some overcrowding.

Social studies of individual cases in children will frequently reveal the adverse conditions in which a child has been living before the first or subsequent attacks. The domestic epidemic of streptococcal infection is, indeed, worthy of a much closer study.

Extension of Social Inquiry.—It is not enough to blame poverty as the main ætiological factor in rheumatic fever and carditis: the specific influences within the framework of poverty must be identified. There is a need for fuller information bearing upon urban, rural, institutional, and domestic epidemiology; and morbidity must supplement mortality studies. Notification, long advocated and already operated in certain areas, is an urgent necessity. Without it, little more can be learnt of the disease's secular trend or of seasonal or regional fluctuations; and without it, local health officers cannot conduct specific surveys. Many questions await answers. How far will the trend of rheumatic fever in a city with a high incidence be influenced by the gradual transfer of ill-housed populations to new estates? How far are secondary attack-rates in individuals affected by improved sleeping accommodation and better-built houses? To what extent may school, as distinct from domestic, epidemics of sore throat have an effect on the rheumatic-fever rate? Should the institutional epidemic be related to heightened bacterial virulence, or, more simply, to heightened atmospheric concentration of bacteria with increased exposure risks?

Notification.—There are obvious difficulties in the way of notification. The diagnosis of rheumatic fever is often much more difficult than that of the common exanthemata; but consultant and other facilities are likely soon to become available in all cases of doubt. Rheumatic fever is often recurrent. Should secondary attacks be reported? What should be the criteria? Should a rheumatic heart lesion discovered for the first time in a child or adolescent in the absence of recent activation be notified? It might be stipulated that for purposes of central registration, all cases of juvenile rheumatism and chorea, and of acute carditis and valvular disease in young persons, believed to be of rheumatic origin and seen for the first time, should be notified locally and centrally; while all secondary attacks should be notified locally in order to ensure the fullest possible coöperation between practitioner, local health authority, and consultant, and the full use of special services. Old-established rheumatic heart disease, not recently reactivated, and seen for late cardiac symptoms or discovered in the course of a general examination, should not be notified.

CONCLUSIONS

Poor social circumstances, and especially the conditions accompanying working-class life in large cities, have been established in this country as of outstanding ætiological importance in rheumatic fever. Overcrowding is probably the most potent individual factor. But crowding itself is a further subject for study, since limitation of cubic space is not the sole factor at work. Defective ventilation and lighting, and dust, may all help to maintain too high a concentration of noxious bacteria; and disturbed sleep and lack of opportunity for open-air play may impair resistance to infection. Compulsory notification of rheumatic fever would greatly assist those epidemiological and ætiological studies upon which the further development of preventive action must be based.

MEDICAL SPECIALISTS IN THE ARMY

SHORT-SERVICE COMMISSIONS OFFERED

SHORT-SERVICE Regular Army commissions are to be granted to specialists in the Royal Army Medical Corps. Specialists or graded specialists with at least six months' commissioned service as medical officers in the R.A.M.C. on full pay during the present emergency will be considered for such commissions. The period of service is to be (*a*) four years on the active list followed by four years on the Regular Army Reserve of Officers, or (*b*) three years on the active list, followed by five years on the R.A.R.O. Graded specialists are eligible only for (*a*).

From the date of their appointment to a short-service (specialist) commission, full specialists will be granted the war substantive rank of major, and this rank will be retained throughout the period of the commission even though the war-time promotion code may end in the meantime. Specialists and graded specialists with short-service commissions will be eligible for specialist pay, and on completing their period of short service on the active list (if not selected for a permanent commission) they will qualify for a gratuity of £750 for four years' service or £550 for three years' service.

Specialists or graded specialists who have been released from the Army are invited to apply to the Under-Secretary of State, the War Office (A.M.D.1), 39, Hyde Park Gate, London, S.W.7, for fuller details and form of application.

". . . It seems certain that the mother is the best and safest nurse for her own baby. . . .The arrangement, formerly considered ideal, of new-delivered women together in one ward and their babies segregated in another is bad physiology and perverted humanitarianism. . . ." *Med. Offr* June 1, p. 210.

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THE WORLD'S FOOD

FROM OUR SPECIAL CORRESPONDENT IN WASHINGTON

THE conference of the Food and Agriculture Organisation (F.A.O.) of the United Nations has adopted realistic proposals backed by all the nations attending, many of which were represented by ministers of their governments. All these have with full authority pledged themselves to undertake world-wide duties of international coöperation.

Over all the meetings brooded the influence of Sir John Orr, whose appointment as director-general of the F.A.O. has been an outstanding success for the United Nations. Discussions have been marked by absence of generalisations and "politics," and the abundant presence of facts. This conference, so long prepared, has meant very hard work for the staff—not yet large enough but highly experienced and competent.

The main proposals are (1) those for coping with the present world food crisis, which may last until 1948, and (2) those for the long-term policy of the F.A.O., looking to the ordered development and distribution of world food resources.

To meet the immediate crisis an International Emergency Food Council is to be formed which will have power to deal with any matter "relating to the supply and distribution, in or to any part of the world, of foods, agricultural materials from which foods are derived, and equipment and non-food materials ancillary to the production of such foods and agricultural materials." The powers are those of recommendation; the guarantee of fulfilment is the pledge of the representatives of the nations assembled to carry those recommendations out. Collaboration will be extended to others of the United Nations not represented, and it is hoped that Soviet Russia will come in; as soon as the new council is formed she will be formally invited to do so. There will also be coöperation with other international bodies. The F.A.O. will send representatives to the meetings of the International Emergency Food Council, and the F.A.O will provide for it the information on which it will work.

These proposals are a breakaway from practice hitherto by which the Combined Food Board, consisting of representatives of the U.K., U.S.A., and Canada, was the only world body dealing with this side of the world food organisation. All the United Nations will be able to be represented on the International Emergency Food Council, and the representatives of the Combined Food Board will hand on their experience and records to the new body, the first meeting of which will be called by the board. UNRRA, so long as it exists, will work in association with this council and with the F.A.O., and its food functions will later devolve on them. This is done with the cordial consent of the present director of UNRRA, Mr. La Guardia, who emphasised at the committee meetings that UNRRA was established as a temporary organisation.

As for the long-term proposals, Sir John Orr has undertaken to present to the F.A.O. conference a plan which will enable its aims to be realised. Some of the organisation and all the experience of the crisis council will no doubt be of great value to the long-term organisation. But, looking ahead, plans are already in prospect for dealing with surpluses of food rather than shortages. Even now there is in some Scandinavian areas a surplus of fish which cannot be distributed owing to lack of facilities in Continental Europe.

While the temporary and crisis organisations are completing their work of immediate relief—up to, say, 1948—F.A.O. will be preparing its plans, so as to be ready to take over the world organisation when the present difficulties have been surmounted. These plans will be for a world of plenty and for realisation of the decisions made by the original conference at Hot Springs out of which F.A.O. arose. We have to raise living standards in all the countries of the world.

A Chadwick lecture on Plants in the Service of Mankind will be delivered by Miss E. M. Delf, D.SC., at the Chelsea Physic Garden, Swan Walk, London, S.W.3, on Thursday, June 20, at 4 P.M.

In England Now

A Running Commentary by Peripatetic Correspondents

LAST week's congress of the Royal Sanitary Institute at Blackpool was voted a success, though it lacked some of the gusto of similar occasions in the U.S.A. Blackpool is not Atlantic City; there were no congress buttons and no beguiling *Boost for Bugsville* flashes in the delegates' lapels. But pleasure was none the less intense for being relished sedately. To the seaside resorts a congress like this is a welcome windfall filling with profit the dull gap between Easter and Whitsun: to the delegates it means a change of air, meeting old friends, talking things over, and perhaps listening to a few speeches—all with the pious knowledge that attendance is required by duty.

We heard Lord Woolton complain in his presidential address of the custom of sending speeches to the printer before they are uttered. To the speaker this may indeed seem a barbarous practice; he must feel rather like a man committed to a long anecdote in the painful awareness that his listeners have heard that one before; and the tendency must be to gabble the tale and be done with it. But for the hearer the advance copy is an undiluted blessing; it allows him to let his attention wander over any facet of the subject, knowing that nothing has been lost which cannot be picked up later. Incidentally, Lord Woolton revealed that when he held office he spent ten hours preparing each of his ten-minute radio speeches, which may partly explain the housewife's support of his ministry throughout the war. I expect it had taken Sir Weldon Dalrymple-Champneys some hours to compose the verses he delivered in proposing the president's health at the congress dinner. Modelled on the Spirit's "Address to the Lord President" in Milton's *Comus*, they were apt and witty, and altogether well repaid his trouble.

This was not Lord Woolton's first appearance at an institute congress: he read a paper before the last meeting held in Blackpool in 1933. It seems that the congress marks each successive doubling of its size by a visit to Blackpool. The first meeting there, in 1914, was attended by 450 delegates, the 1933 congress drew 800, and this year there were 1600 (not including 500 members attending privately, paper-readers, officers of the congress, and visitors). This easily beat the previous record of 1188 at Portsmouth in 1938, even though the contingent of overseas visitors was smaller than usual. This year there were more women local-authority delegates than ever. One man was heard to say as he gazed wistfully at the gathering: "Men used to attend the congress and bring their wives. Now the wives attend and the husbands are brought if they're lucky."

The time-honoured practice at congresses is to devote the morning to meetings, and leave the afternoon free for excursions. Those who visited the Ministry of Pensions optical appliances depot at Norcross watched artificial eyes being made from plastics, which can be "tailor-made," like teeth, from a mould, and are unbreakable, non-irritating, and so light that a useful amount of movement can be attained. Others who preferred to stay nearer home could visit Blackpool's health centre, where all the administrative services and certain clinics have been brought together in a converted hospital. The system has operated well in practice and is particularly easy to control.

It might be thought that in summer, when Blackpool's normal population of 150,000 increases by a quarter to half a million, the burden to the public-health staff would be correspondingly increased. This is not so, though naturally the general hospitals admit more accident cases. When an infectious disease does crop up in a boarding-house, the delicate problem of isolation demands diplomatic action. Alleged cases of food-poisoning, which usually turn out to be something much less malignant, must be investigated; the town is especially scrupulous in food inspection to avoid such calamities. What is concerning the staff at the moment is ice-cream: it is thought that the statutory powers, which are limited to the granting or withholding of licences for manufacture and sale, according to the suitability of places for these purposes, should be extended to the control of cleanliness

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and quality. At the moment there is nothing to prevent a merchant dispensing ice-cream with 20–30 million organisms per c.cm. Perhaps more will be heard of this at next year's congress in Torquay.

* * *

Believe me, coronary thrombosis is very frightening. I would rather be shelled or bombed, and the textbooks are quite right on the fear of impending decease. This hurricane hit me on getting out of bed on a Sunday morning and I was on my knees in a very short time. There was no respite until the morphia which my partner liberally pumped into me had taken effect. Then what bliss; even with no pulse! What they don't mention in the textbooks is the appalling amount of flatus—fore and aft and non-odorous—and the terrific sweating at the time (I soaked clean through a thick winter dressing-gown), and within a day a complete red-raw painful tongue. Lying in bed the worst symptom was the continued belching, and Bang-bang! would go the extra systoles in keeping. This lasted about 7 weeks and then quite suddenly disappeared.

It is a sad reflection that with Bailey bridges, radar, Mulberries, and atom bombs, no-one has taken the trouble to ease the problem of the cursed bedpan. I am glad you have stirred up interest in this disgraceful anachronism. I told Sister that my pattern hadn't changed since the Crimea, and she very pertly replied that neither had the backside. Don't tell me there is no strain in a cardiac patient sitting at an obtuse angle, apart from the audience of your senior nursing staff during the first week—all very anxious. Why can't you be heaved out by pulley and block and left alone with a pipe?

One other point, and it is a very real one. I would advise everyone over 50 to practise using a urinal in bed when perfectly fit, and not wait till disaster arrives—it's not so easy!

* * *

An old colleague from Malta has just brought me the welcome news that the historic hospital of the Knights of St. John has mercifully survived the island's record blitz. Many Service men will recall that the hospital consisted of a single long room—said to be the longest room in Europe—and that was all the accommodation which the wealthy and generous Order of Knights Hospitallers could provide for their patients. We have indeed changed all that. Today my desk is littered with demands made by quite sane and responsible people for amenities for patients in general hospitals—all guaranteed to be essential for their well-being and all in addition to strictly medical and nursing requirements. An incomplete list would have to include a heated swimming-bath 100 feet long; a library of 5000 books; a gallery of reproductions of classical pictures; lecture-rooms for education up to university standards; workshops for carpentry, pottery, weaving, and half a dozen other varieties of handicraft; a flat for mothers whose offspring are in the children's block; canteens for out-patients; a fully equipped gymnasium and outdoor playing field; and extensive accommodation for a staff of social workers. I hasten to add that a good case can be put up for any or all these luxuries. But how on earth did those Maltese patients of old manage to recover? One can sympathise with the hospital architect confronted with a modern specification who remarked wistfully that unless he was given Hyde Park for a site he didn't see how he could find room for any patients at all.

* * *

Never was a majority more oppressed than we psyche blokes! For years have we struggled for our independence of the anatomists and pathologists. And annually we are set back on our heels by an official manifesto entitled *Recent Advances in Neurology and Neuropsychiatry*. That's us, folks! Neuropsychiatrists! And just in case we forget the fact between these broadsides they snipe at us from time to time with journals bearing the same labels. Yes, you neurologists—well may you clutch nervously at your tendon hammers. This is mutiny and the first blow will be a counter-manifesto *Recent Advances in Psychology and Psychoneurology*. Had you not denied us the title of psychiatrists, you would not now be listening to our battlecry "A bas les psycho-neurologists!" We are merciful in leaving you such a designation: but we are not so bigoted as to fail to see that when you stick a pin in a fellow's calf you are performing a rudimentary examination of his organised sentiments and conative tendencies, which quite overshadow, even if they are not independent of, the integrity of certain of his neurones. There always was much more of the psycho in you than there is of the neuro in us. Certainly we are interested in the physical state of the C.N.S.; but also in that of the alimentary tract, kidneys, heart, and other odd lumps of tissue that contribute towards the welfare of our minds. To pursue the rationale of your classification to its logical conclusion, we should soon have gastropsychiatrists, nephropsychiatrists, and even (here I recall a massive tome on the surgical shelves of the College library, devoted entirely to *The Umbilicus*) those most subtle of all specialisations, the companion schools of the omphalopsychiatrists and the psycho-omphologists.

You precipitated this rebellion yourselves, you know. In an American journal I have just waded through an article on "neuropsychiatric selfstarvation" which I identify, with the aid of my crossword training, as our old friend anorexia nervosa.

* * *

Public-health propaganda by means of posters is no doubt valuable, but it sometimes gives rise to mental confusion. The widespread use of posters in the anti-venereal-disease campaign of the Ministry of Health tends to make one assume, subconsciously, that every poster using the particular artistic technique favoured by the Ministry deals with the same topics. Thus for some moments I found that I was assuming that the alarming slogan KEEP DEATH OFF THE ROADS was a warning against street-walkers. Incidentally, though I disapprove of the posters on Nelson's monument, I feel that it would have cheered up Trafalgar Square if the Ministry of Health had been allowed to use this space for the V.D. campaign. I understand that their request for permission was turned down.

* * *

Civilian relief work in Malaya is a praiseworthy if rather thankless task. Supplies of drugs, dressings, and other necessities of a well-conducted hospital are still inadequate. However, recently an unexpected supply of milk intended for the relief of the destitute arrived in our small town, and after much discussion it was decided that the hospital should run a free milk clinic for the undernourished babies of the district. Letters were circulated immediately to the Indian clerks in charge of the coolie lines of the local rubber estates, beseeching them to send up any children who seemed worthy of receiving free milk. Results were discouraging, for apparently only the families of the clerks concerned were considered to be undernourished. Just as we were becoming thoroughly disillusioned about the goodness of mankind, the following letter was received which restored our almost lost faith.

To the Lady Medical Officer, Women Hospital, Kuala Pilah.

Honoured Lady Goddess,

First of all let me wish you a happy new year for the prosperity and the advancement in profession, and for a long life in the happy world.

After a lengthy four years monstrous suffering under the Japanese inhuman administration I have the opportunity to embrace thou dawning memo dated the 28th January 1946 containing the extention of sacrificing towards the invalid children free supply of milk. I am sure that it will earn a reputation and devotion to Heaven for thouself, generations, nation and even result ever existing strengthy legs to the British Empire, as long thou are an employee under the Government, in the long run, and I too pray from the bottom of my heart that the British Military Administration may be provided to establish different charities as far as possible and to assist Thou in the undertakings of the Hospital administration to which it deserves blessings and Wholehearted Thanks.

I have not got any such cases to send in at the moment as the Estate is non-inhabitant and I shall not fail to send in such cases if I happen to come in touch with.

Thanking and Respecting you with fidelity,
I have the honour to be, Honoured Lady Goddess,
Your obedient Servant.

One can only hope that the strengthy legs of the British Empire remain steadfast when the supply of free milk is exhausted.

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Letters to the Editor

ACUTE BENIGN DRY PLEURISY

SIR,—Dr. J. G. Scadding (May 25) has given a very instructive account of the symptomatology of acute benign dry pleurisy, or Bornholm disease. In a small series of cases which I observed in the Central Mediterranean Force I noticed a symptom which Dr. Scadding did not mention—namely, inability of the patient to lie on the affected side. This symptom, trivial in itself, aroused a certain amount of interest because it seemed out of harmony with Nature's principle of resting injured parts. In discussion with colleagues the theory was advanced that lying on the affected side would restrict the movement of the chest wall and hence cause increased excursions of the diaphragm of the affected side. I was unable to verify this plausible explanation; in any event, most of my patients either volunteered this symptom, or admitted it on questioning.

I am not sure whether the term acute benign dry pleurisy is a happy choice. We observed a number of cases of acute benign dry ("fibrinous") pleurisy which differed in several important particulars from what we came to know as "Bornholm disease." Three patients, for instance, were in hospital with the symptoms and signs of acute dry pleurisy who, on later radiological examination, were proved to have had primary atypical pneumonia. Other cases of acute dry pleurisy were seen which showed no radiological evidence of pulmonary consolidation. The onset in these cases was gradual rather than sudden; catarrhal symptoms were present; there was an obvious pleural rub which could be heard for a fortnight or more; and the course of the illness and the duration of the pyrexia were considerably longer than in Bornholm disease. These cases occurred at a time when primary atypical pneumonia was widespread and epidemic, but their final ætiology could not be established. They therefore had to be labelled acute (benign) dry pleurisy. The difference between Bornholm disease and other cases of acute dry pleurisy of unknown ætiology might be tabulated thus:

Bornholm disease	*Acute dry pleurisy*
Onset: Sudden.	More gradual.
Catarrhal symptoms: Absent.	Often present.
Character of pain: Severe, violent.	Less severe.
Spread of pain: Often widespread, particularly to abdomen.	Usually confined to affected side of chest and shoulder.
Localisation of pain: At times bilateral.	Unilateral.
Fever: Short.	A week or more.
Pleural rub: Often absent, or heard with difficulty.	Unmistakable rub present over wide area.
Course: Short.	Long.

It seems, therefore, that a case can be made for retaining a characteristic name for an illness which to the doctor at the bedside has such characteristic features, at least until a more scientific ætiological classification becomes possible. Epidemic myalgia, epidemic myositis, and diaphragmatic pleurisy are all terms which pretend a knowledge which we do not possess. This cannot be said against Bornholm disease, a term under which this interesting condition has been described in current textbooks.

P. F. MEYER
late Medical Specialist, C.M.F.

London, W.1.

REVOLT FROM THE BEDPAN

SIR,—Dr. McClean's condemnation of the bedpan in your issue of June 1 is fully justified, and my only criticism is that he has not gone far enough in his denunciation. His "worm's eye" view, as he describes it, might more aptly be termed a man's eye view. From a woman's point of view the horrors of the bedpan are multiplied many times. A man generally uses a bedpan only once a day, relying for micturition on the comparative luxury of the bed-bottle. A modified version of this is sold as a "female urinal" but most women find that they cannot make use of it and it is therefore seldom or never offered to them. They are lifted on and off bedpans with varying degrees of difficulty and discomfort many times a day if micturition is frequent.

There is no doubt that a commode could often be used in cases where a bedpan is at present used, but there will still remain cases where it is inadvisable to get the patient into a sitting position. It is difficult to think of a suitable substitute for these people, but the difficulty should not be insurmountable. The problem is to maintain the patient in a recumbent position and to insert beneath him a vessel which does not come into unnecessary contact with him or require any movement on his part to adjust himself to it. Manufacturers of hospital equipment who have experience in these matters might well devote serious attention to this problem. The solution might of necessity be somewhat cumbersome but it would not in the long run be more troublesome or *umständlich* than the series of objectionable procedures connected with a bedpan to which you have drawn attention in your leading article.

From bedpans to beds is but a short step. Hospital beds have shown little advance from the dark ages, and it is astonishing that doctors and nurses have tolerated their defects for so long. But this is a subject for an article in itself!

J. M. HAMILL.

London, S.W.7.

SIR,—Dr. McClean's cri-de-cœur and your leader prompt me to put forward an idea which has been in my mind for some time. I suggest designing a bed in such a way that a circular portion, in a position where pneumatic rings are usually placed, could be lowered out of the way and a reasonably deep chamber levered into its position. (Sheets with a circular opening in them would have to be provided.) The patient would thus be able to defæcate without change of position and with little or no aid from attendants. Such beds would be reserved for the seriously ill and consequently only a limited number would be required for the average hospital ward.

In an age when intricate machines, especially those meant for destructive purposes, are commonplace, it surely should not be beyond the wit of man to design such a contrivance; and what is more it should be possible to incorporate in the mechanism a device for swinging the receptacle clear of the bed, possibly into a recess in the wall where it would be sterilised automatically.

A. M. NUSSEY.

Birmingham.

THROMBOCYTES AND PLASMA PROTEIN

SIR,—May I bring to your attention an observation made on several occasions at our clinic of gynæcology and obstetrics?

Anæmia during pregnancy is not infrequently of the macrocytic type. This has been given several names, including the pernicious anæmia of pregnancy. Many ætiological factors have been suggested but none have been proven. It has been assumed by some that there is a deficiency of the so-called extrinsic factor, and this contention is supported by the lack of antenatal care that is almost universally found in this group of patients. Recently it has been suggested that deficiency of protein especially is followed by a gradually onsetting macrocytic anæmia.

I would especially refer to the constant thrombocytopenia seen. Platelet counts are constantly low, reaching dangerous levels frequently. We have observed that such diminution of platelets may be noted often in advance of demonstrable anæmia, and feel that such a finding may be a warning through which the very grave illness that follows may be averted.

The relationship between plasma-protein levels and thrombocytopenia is striking. In one of our cases the plasma proteins were 3·39 g. per 100 c.cm., with a platelet count of 47,000 per c.mm. This patient was given large doses of proteolysed protein intravenously, with a dramatic rise in both the plasma-protein level and the platelet count. Within four days of such therapy the plasma proteins had risen to 6·5 g. and platelets to 223,000.

We have observed that such rapid elevation of platelets cannot be attained by whole-blood transfusion, or by the parenteral use of liver. It seems, therefore, that the depression of platelets in this condition is due to inadequate protein ingestion and that correction can be obtained by their use intravenously. Further investigation with other types of thrombocytopenia would seem warranted.

In further observations, during toxæmias of pregnancy, a coincidental hypoproteinæmia and thrombocytopenia has been noted. Both of these observations have been made before [1] but have not previously been related.

1. Tocantins, L. M., *Medicine, Baltimore*, 1938, **17**, 155; Dodge, E. F., Frost, T. T. *J. Amer. med. Ass.* 1938, **111**, 1898.

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In a series of six pre-eclamptics and one severe eclamptic, we have observed that a hypoproteinæmia and thrombocytopenia coexisted, and further that in every case, when high-protein feedings were given by mouth or vein, there was a rapid elevation of both the plasma-protein level and also the level of platelets. In one severe pre-eclamptic the initial plasma-protein level was found to be 4·0 g. and platelets 117,000. Following high-protein feedings by mouth, supplemented by oral hydrolysed protein, there was a rise over six days to a level of 5·78 g. for protein and 195,000 platelets. Similar findings were consistently made with other cases.

The patient with eclampsia was admitted with a blood-pressure of 160/110; albumin of 10 g. per litre, and almost complete suppression of urine. The plasma proteins were 3·9 g., and the platelets 88,000, falling over the next twelve hours to 52,000. Convulsions occurred on the evening of admission, and recurred every 20–30 minutes. Spontaneous epistaxis and bloody vaginal discharge were present. The patient was treated with sedatives and intravenous hydrolysed protein. There was a dramatic improvement in her condition with this therapy, with cessation of convulsions, rapid return of consciousness, fall in blood-pressure to 128/78, reduction in albumin to 0·6 g. per litre, and marked diuresis. Intravenous hydrolysed protein was continued for three days, and the plasma proteins rose to 6 g., with platelets rising to 210,000.

Although the observations recorded here cannot be conclusive, it would appear that there exists a relationship between plasma-protein levels and platelet levels in pregnancy, and that protein ingestion stimulates platelet formation. Further studies on the subject are in progress.

Montreal. J. L. MACARTHUR.

WOMEN AND MEN IN SPORT

SIR,—In a 60-mile road race held between Pietermaritzburg and Durban a woman covered the course in less than 12 hours, beating many men. Several girls have swum the Channel, and others have become professional wrestlers and football players. Extraordinary as such feats are, the physical efficiency of women is inferior to that of men. World records for the 100 and 220 yd. races are 9·4 and 20·3 sec. for men, and 11·0 and 24·3 sec. for women. The male 220-yd. world champion runner has thus beaten the woman record holder by not less than 40 yd. The position is similar in jumping, throwing, swimming, and skating. Though the discus used by women weighs 2 lb. $0^3/_4$ oz. as against 4 lb. $6^2/_5$ oz. by men, the world records are 158 ft. 6 in. for women and 174 ft. 10 in. for men. Even the greatest women tennis players cannot compete against men, as Suzanne Lenglen, Helen Wills Moody, and others have shown. The longest golf drives of men have covered distances almost twice those attained by the best women players. Scheinfeld [1] has pointed out that in a basket-ball game men travelled 3·46–3·89 miles, compared with 0·96–1·22 miles for girls. He also emphasises that all speed records for horses are held by stallions or by geldings. Similarly, male greyhounds are superior to females in competitions, and the latter, like mares, are handicapped by their heat periods, which in greyhounds come on twice a year for three weeks at a time, during which they cannot be raced.

A mass survey of speed, strength, and endurance of boys and girls undertaken in South Africa [2] revealed a distinct performance superiority of boys over girls in respect of all factors tested. This superiority was well established already at the age of 6 years. It became progressively greater after the age of 12 years. In physical endurance girls regress during adolescence, whereas boys continue to improve. These statements refer to statistical averages. The position is actually more complex. If one considers the wide distribution of body measurements and of physical performances in any large sample of children, one is impressed with the extent of overlapping of the data—e.g., at all ages tall girls are taller than are small boys. The same applies to weight, body bulk, and physical efficiency. At the age of 17 the tallest girls are 10 in. taller than the smallest boys; corresponding differences in weight amount to more than 80 lb. At 12 years of age the best girl athletes of our sample put the 12-lb. shot 125 in., as against 75 in. attained by the poorest boy performers. Outstanding girl runners covered 600 yd. in 130 sec., whereas more than 5% of the boys required 163 sec. The running times for 100 yd. were 14·4 sec. for the "good" girls and 18·6 sec. for the "bad" boys. Altogether, the upper third of any large sample of girls between 6 and 16 years of age may be expected to beat the lower third of boys.[3]

After puberty the physical-efficiency superiority of the boys, as shown by a comparison of the performance means for the two sexes, becomes more pronounced in degree and consistency. Similar trends can be seen in vital capacity. These phenomena are no doubt explained by the altered patterns of internal secretion, which establish themselves finally at this time of life. Girls aged 13 years in whom puberty has not yet set in are smaller and thinner than girls of the same age who have already entered puberty.[4] At the same time they are better long-distance runners, though less efficient in shot-putting, a fact explained by the intimate interrelationship between body-weight and physical performances.[5]

Metheny and co-workers [6] studied the effect of exercise on various respiratory, circulatory, and biochemical functions of 17 women graduate students in hygiene and physical education, aged 20–27, comparing them with 30 men students at Harvard University, aged 19–23, who had been classified in respect of their state of fitness as good, average, and poor. The differences found between the physiological responses of the men and the women were similar to those differentiating the trained from the untrained men. Again, the best women performers were equal or superior to the poorest men. In running uphill at a rate which does not permit the attainment of a steady state the best women and the poorest men were exhausted in the same time. The results obtained with these groups were equal in respect of maximal ventilation, oxygen consumption, respiratory quotient changes, blood-lactate level, increase in pulse-rate, maximal pulse-rate, rate of recovery, and blood-pressure reactions. Only in long-continued physical activities of lower intensity were even the most highly trained women less efficient than were any of the men.

Some differences in athletic efficiency between boys and girls are due to mechanical features. Specific gravity of the male body is higher than that of the female. In such sports as rugby, gymnastics with apparatus, and weight-lifting, in which compactness and bulk play an important part, women are distinctly handicapped. A sport in which the low specific weight of women is of advantage is swimming, so here performance differences between men and women are less marked than they are, say, in wrestling or boxing.

In a study of this problem, the average height of outstanding women middle-distance runners was found to be 161·8 cm. and their weight 50 kg., as against 167·5 cm. and 64·88 kg. for first-class women throwers. Male middle-distance runners of repute measured 170·2 cm. in height and weighed 72 kg., whereas successful "strong men" were 181 cm. tall and weighed 90 kg. Thus, it is not difficult to explain why the world record for running 800 yd. stands at 2 min. 26·6 sec. for women and at 1 min. 48·2 sec. for men. The best men athletes have put the 16-lb. shot over 57 ft. as against the women's record of 47½ ft., which was established with the 8-lb. shot.

An interracial comparison of athletic efficiency has revealed an impressive superiority of the black-skinned African over the white races.[7] This superiority is much greater in African women than it is in African men, more particularly in respect of physical endurance. In the United States the high physical performance potential of Negro women was strikingly demonstrated by the success of the Tuskegee University team in the National Amateur Athletic Union's women championship

1. Scheinfeld, A. Women and Men, New York, 1944.
2. de Jongh, T. W., Cluver, E. H., Jokl, E. *Manpower*, 1942, **1**, 10.
3. Jokl, E., de Jongh, T. W. *Ibid*, 1943, **1**, 17.
4. Jokl, E. *Nature, Lond.* 1946, in press.
5. Jokl, E. *Ibid*, 1944, **154**, 830.
6. Metheny, E., Brouha, L., Johnson, R. E., Forbes, W. H. *Amer. J. Physiol.* 1942, **137**, 318.
7. Cluver, E. H., de Jongh, T. W., Jokl, E. *Manpower*, 1942, **1**, 39.

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which they won by a considerable margin when they competed for the first time in 1937 and 1938.[8]

It would be erroneous to assume from such evidence that women's motor performances are categorically inferior to those of men. Competitive sports and athletics are typically male pastimes, and to judge women on a scale which ex hypothesi is made for men is not fair. If we extend our survey to motor activities which involve the expressive as well as the achievement aspect, we arrive at very different results. In entire sections of physical education—e.g., eurhythmics and dancing—the female sex reigns supreme. Horne and Philleo,[9] in a comparative study of the spontaneous play activities of children aged 6–7 years, found that girls already showed more interest in dolls, sewing, and threading beads than in playing croquet, solving puzzles, or constructing buildings from blocks.

Muscular efficiency is not the only, and certainly not the final, criterion of human values. Wiggam,[10] from his studies of character components, concluded that both gifted and ungifted girls were superior in "morality" to both gifted and ungifted boys. There is, he says, a sudden drop in "morality scores" in boys when they become 13 years old. Girls do not show such a drop. They continue to progress steadily upward, notwithstanding the fact that at the same time their physical-performance scores remain behind those achieved by boys, or even decline.

Johannesburg, South Africa. E. JOKL.

TUBERCULOSIS AND SANATORIUM TREATMENT

SIR,—For over sixty years the medical profession and public-health authorities, in their treatment of pulmonary tuberculosis, have relied chiefly on the sanatorium; and it is now almost automatic for phthisis patients of all kinds to be sent to an open-air hospital for a few months—usually not long after the disease has been diagnosed. Sanatorium treatment, therefore, may be said to be accepted by both the medical profession and the public as the principal method of arresting pulmonary tuberculosis. Since, however, a large proportion of cases end fatally within a few years, and a larger proportion drag on for a long time in chronic ill health, and since the incidence of the disease has recently increased, it may be pertinent to inquire whether sanatoria are as successful as they should be.

I write as a layman; but three spells of sanatorium treatment, as well as periodical visits to sanatoria, have convinced me that the treatment offered often does more harm than good; while in cases which improve the improvement could be greater if conditions of treatment were less rigorous. Entry to a sanatorium usually involves a drastic change in living conditions, which in too many cases leads to the patient contracting a chill during the first week of his stay. Many cannot stand so much exposure, especially in the winter-time, and I want to suggest that as a curative factor it is greatly over-rated.

In my opinion no greater departure from ordinary home life is necessary, in the treatment of tuberculosis, than the opportunity to breathe plenty of fresh air—a "change of air" in most cases—and to take good food and acquire regular habits. All these could quite easily be offered under greatly modified conditions at a sanatorium if common sense had more play. Recovery from an attack of tuberculosis depends largely on the patient's constitutional ability to fight the disease, and the regime employed should therefore assist his natural powers of resistance and help to build up his general physical condition. In some sanatoria severe and unnatural conditions are an added burden to him.

During rest periods, for example, patients lie down for an hour, generally on top of their beds, soon after a spell of work or a walk, when they are in a "sweaty" or overheated condition. Rest periods, of course, must enter largely into the treatment of tuberculosis, but there is no reason why patients should feel chilled to the bone while at rest. This has often happened to me during sanatorium treatment, and recent inquiries have convinced me that it is still happening to others. Rest periods should be spent under conditions which allow the patient to feel comfortable. Indeed, his comfort is of paramount importance, for unless he finds conditions better than just tolerable the treatment is not likely to do him much good.

I consider that chalets and revolving shelters—wooden erections dumped down in the sanatorium grounds, with no heating apparatus, and consequently damp—should be abolished. Residence in them, especially during the colder months, would make a healthy man ill, and they are wholly unsuitable for invalids.

I suggest that the most effective way of combating pulmonary tuberculosis would be (1) to teach the public the earliest symptoms of the disease, so that chances of early arrest would be appreciably increased; (2) to modify considerably the exposure at present endured by patients in sanatoria and tuberculosis institutions; and (3) to provide hostels, run on convalescent-home lines, within easy reach of the larger towns, where ex-sanatorium patients, finding things a bit difficult after their return to work, might make a short stay.

Glasgow. BELLEFIELD.

IMPACTED CHERRY-STONES

SIR,—Because the soft-fruit season will soon be here the following case seems worth recording.

A girl, aged 17 months, was admitted to hospital on July 29. The mother said that the child had been constipated since birth. For three days before admission she had been passing dark semi-solid fæces every two or three hours, and during the passage of the motion she screamed loudly and was obviously in great pain; she had vomited once before admission.

The child was well nourished. There was no fever and the general physical findings were normal except in the abdomen. Three small hard irregular movable masses could be felt in the line of the colon. Radiography of the abdomen did not show any abnormality. A rectal examination was not attempted until Aug. 1. The anal sphincter was in tight spasm which could not be overcome, and the tip of the finger only could be inserted, a gritty sensation being conveyed to the finger. Next day the child was anæsthetised but the spasm of the sphincter still could not be overcome with the finger. The sphincter was dilated with Hegar's dilators and a sound, and the dilator was felt to strike what seemed to be a calculus. A finger was then inserted into the anal canal and numerous small stones were felt, which on delivery proved to be cherry-stones; 53 stones were delivered and more could be felt higher up, the tumours in the abdomen still being palpable. During the next week the child passed 186 more cherry-stones normally, and up to Sept. 4 251 stones in all were recovered. The palpable tumours in the abdomen had disappeared by this time and the child was discharged quite fit.

After the first batch of cherry-stones was recovered under anæsthesia the mother was questioned further. She said she had been engaged as a cherry-picker during the fortnight before the child was admitted. She used to take the child to the orchard and leave her on the ground under the trees when she started work. Presumably the child had helped herself unstintingly to dropped cherries and those from the baskets, swallowing stones and all.

PHILIP BERRY
County Hospital, Chatham. Medical Superintendent.

THE honorary fellowship of the Society of Medical Officers of Health has been conferred on Sir George Elliston, founder and editor of the *Medical Officer* since 1908, former executive secretary of the society, M.P. for Blackburn 1931–45, and at present chairman of the public-health committee of the City of London, and of the board of management of the London School of Hygiene.

INSULIN was discovered 25 years ago, and the Diabetic Association is celebrating the occasion with a jubilee meeting on July 5 at the Royal Institute in Albemarle Street, London. Sir Frederick Banting, it will be remembered, was killed in an aeroplane crash in 1941, when flying on a government mission, but Prof. Charles Best, his collaborator in the famous experiments, will be present, and he and Sir Henry Dale will address a meeting made up of those who have insulin to thank for their lives.

8. Jokl, E. *Clin. Proc.* 1944, **3**, 355.
9. Horne, B. M., Philleo, C. C. *J. genet. Psychol.* 1942, **61**, 33.
10. Wiggam, A. E. *School and Society*, 1941, **54**, 261.

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Parliament

IN COMMITTEE

FUNCTIONS OF THE HOSPITAL MANAGEMENT COMMITTEES

WHEN the committee resumed consideration of the National Health Service Bill on June 4 members were glad to see Mr. Bevan back in his place. Mr. D. L. LIPSON moved an amendment to clause 12 inserting provisions that the regional boards should be able to appoint their own officers and laying on the hospital management committees the duty on behalf of the board generally to manage and control their hospital or hospitals and in particular to appoint officers, except specialists, to maintain premises and equipment, and to appoint for each hospital in their group a house committee to which they might delegate its control and management. The hospital management committees, he thought, would preserve the link between the old and the new systems and they must have power and functions equal to their responsibilities. Would the Minister consider changing the name from hospital management committee to hospital management board? The management board would function for a group of hospitals but each hospital would have its own house committee to carry out the day-to-day administration. Mr. H. U. WILLINK thought there was wide support for the amendment. The chairman of the Nuffield Provincial Hospital Trust, for instance, held that every person in a hospital should be in contract with and be an officer of the hospital management committee, with the exception of the specialists who ought to be officers of the region. But Dr. R. CLITHEROW thought that if appointments were made by the regional board staff would be more likely to be picked for their ability and not because of whom they knew. Mr. SOMERVILLE HASTINGS saw dangers in the amendment, such as the possibility of another voluntary hospital system growing up within the administration of the regional boards. He confessed to serious misgivings about the proposed right of hospital management committees to receive legacies. It would be dangerous for them to appoint any but the junior staff, for he feared they would always tend to select a known rather than an unknown devil.

Mr. A. BEVAN complained that some of the amendments which had been moved would put the health service into the strait jacket of a statute. We were not defining a statutory contractual relationship between two citizens, but framing a service which might have to be adapted from time to time. Changes would be impossible if Parliament had to pass an amending Bill for every modification. Yet he was sympathetic with the purpose of the amendment, and schemes for the new service would not be accepted unless there was considerable devolution of responsibility to the management committees. But the committees might vary from place to place enormously and if their powers were defined in the Bill bad management committees would be perpetuated by the Bill itself. In fact the domestic staffs and the junior staffs of the hospitals would be appointed by the management committees though they would be in contract with the regional boards. How could there be uniformity of conditions of work unless there were common contracts? Furthermore, if these committees became autonomous bodies we should soon re-create the existing anarchy in the hospital service. He wished the committees to have responsibilities but not statutory rights, because once they began to have rights they began to achieve independence and then we could no longer hold them responsible for certain things they did. If the hospital officers were in contract with the boards there would be greater mobility within the service. He had always thought that one of the reasons the local hospitals were not as good as they ought to be was that the influence of the medical schools did not penetrate to them. Under the Bill the local people would influence the house committees in the day-to-day operation of the hospital, and from the centre there would come a stream of inspiration and refreshment from the medical schools. He did not propose to go a step further than allowing the management committees to receive benefactions and to hold land. The house committee was obviously a necessary unit in the administration of the hospital system, but we could not have one for every separate building. If they were put into the Bill there would be a further difficulty of definition.

Turning to the first part of the amendment Mr. Bevan said that it would be stupid for the Minister to appoint the officers of the regional boards. They were the most vital instrument in the whole scheme. How would it be possible for them to function if they were the puppets of the Minister? Mrs. L. A. MIDDLETON said that the members for Plymouth had been assured by the Ministry that the regional hospital board would not necessarily be situated in the same city as the medical schools and teaching hospitals of the region.

Continuing, Mr. BEVAN said he could not understand the desire for ostentatious nomenclature. What was wanted was to have different names for different things. A hospital management committee was different from a regional board. If you called it a hospital board the same word would be used for the regional organisation as for the hospital organisation. In practice certain ranks of the staff would be appointed by the hospital management committee with no reference at all to the regional boards. Higher up in the hierarchy the boards would make recommendations which in practice the regional boards would usually accept. At the height of the hierarchy the appointments should be made by the boards. A patient often needed to be protected against the ambitions of the hospital management committee. It did not follow that to give local influence ascendancy gave a better service; it often caused fatalities. Nurses would be appointed by the hospital management committees, but would be in contract with the regional boards. The amendment was negatived.

CONTROL OF EPIDEMICS

Mr. J. RANKIN moved an amendment that "the medical officer of health shall act as epidemic officer for the area under the control of the Regional Hospital Board." He explained that he had in mind the principal medical officer of health in the region. Under the trinitarian conception of the Bill he feared the medical officer of health, while retaining responsibility for any outbreak of disease in the community, lost the power to take effective and speedy action to deal with it. If he was appointed epidemic officer under the regional board the three services would be linked up. But Mr. BEVAN thought the invention of the telephone system was sufficient to unite the whole service. The hospitals would be at the disposal of the local authority for all its purposes and there was therefore no need to appoint an epidemic officer. He could imagine all the other doctors going up in smoke if a particular medical officer of health was appointed to be in charge of all services.

WHAT IS A REGION?

Mr. HASTINGS moved an amendment providing that hospitals which are attached to the regional hospital boards need not of necessity all be in the same region. But Mr. BEVAN held the amendment to be unnecessary because as he understood the definition of a regional board it was a congeries of hospitals required for its purposes and it would be possible for the geographical area of London, for instance, to reach out and take in any particular hospital. Sir HAROLD WEBBE asked if the Minister was prepared to give the assurance that the London County Council should be a region, and Mr. BEVAN advised him to postpone his mischief-making until later. Mr. J. S. C. REID asked what an area was if not geographical. Mr. BEVAN admitted it was difficult to define, but there might, for instance, be two regional boards astride two areas. His conception of the word "area" allowed one regional board not possessing a particular institution to reach over and embrace such other hospitals as might be necessary to complete its services. That was the intention and if the language did not fit it would be altered.

Dr. H. B. MORGAN moved an amendment to make statutory provision that every hospital should have a medical staff committee. Mr. BEVAN said it was intended to have staff committees of all the health workers in hospitals and he hoped that he need not regard the medical workers as different from the other workers. On the question that the clause stand part of the Bill, Mr. LINSTEAD asked whether some provision ought not to be made whereby specialists required at health centres

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were clearly declared to be on the regional staff and not on a local-authority staff or an executive-council staff.

Mr. BEVAN, replying, said that specialists would be in contract with the regional board except in so far as they would be employed by the local health authorities under clause 61. He agreed that they would be regarded as part of the specialist service of the regions and treated in the same way as other specialists. He could give no assurance that medical officers of health would be put in any special relationship with the health service. They would carry out their present responsibilities except in so far as they are modified in the Bill. There was no need for anxiety about the right of a medical officer to get his patient into a hospital at once. No hospital would have the right to refuse a patient. The services were not put at the doctor's but at the patient's disposal.

DIRECTIONS

Mr. WILLINK, in raising the question of directions, referred to a leading article in THE LANCET of May 25 which asked whether the Minister conceived that the Bill gave him power to give directions of a purely medical character. Medical directives in war-time had been issued in connexion with the E.M.S. and THE LANCET was concerned that the Minister should give some assurance as to the limitation of the word "directions" in the clause. It was his intention, Mr. BEVAN affirmed, that directions should be administrative and not medical. The Minister would not accept the odium of giving directives about any particular form of therapy. That was a matter for the professional man using the apparatus put at his disposal by the State, quite free and without any interference. directions, instructions, or prohibitions.

The clause, as amended, was ordered to stand part of the Bill.

RESEARCH

Colonel M. STODDART-SCOTT moved an amendment to enable the Minister to make, or assist to make, research not only into the prevention, diagnosis, and treatment but also into the causation of disease. Mr. BEVAN said he understood that a reasonable interpretation of the language of the Bill allowed causation to be included, but to make it doubly clear he was prepared to accept the amendment; and clause 17 was ordered to stand part of the Bill.

BLOOD-TRANSFUSION

Mr. P. PIRATIN moved an amendment deleting the provision for making supplies of blood available on payment of charges. Mr. BEVAN explained that the amendment would have the effect of preventing the Minister from making charges for any substances discovered in the future. It was not proposed to charge for things which existed today. Blood for instance would be supplied free to local authorities.

Mr. HASTINGS pointed out that the doctor would be under contract with his patient to give the necessary treatment, yet he might not be able to recover the cost of these new substances. Mr. BEVAN reminded him that there might be doctors outside the public service and we could not subsidise private practice. But the patient would retain his right to use any part of the service even when not using the general-practitioner service. It was proposed, he added, to set up a standing advisory committee, on which blood-donor organisations would be represented. The clause was ordered to stand part of the Bill.

On June 5 Mr. C. W. KEY moved a drafting amendment to clause 19 to secure that local authorities can be formed into joint authorities to carry out health functions other than those mentioned in the Bill, such as those connected with the Lunacy and Mental Treatment Acts and the Mental Deficiency Acts.

WHAT ABOUT LONDON?

Mr. WILLINK moved a lengthy amendment to provide for a division of the local-authority health services between the London County Council and the metropolitan borough councils. In this clause maternity and child-welfare work was transferred to an enormous overburdened authority, where 120 councillors represented 3,600,000 people. The London County Council was peculiarly suitable for great mechanistic services, but it was the least suitable authority in the whole of the country for home helps, home nurses, antenatal clinics, child welfare, and such-like matters. In every other county there was a division of these functions.

After the publication of the Coalition white-paper on the health services in February, 1944, the metropolitan boroughs standing joint committee, of which Mr. Key was chairman, had discussed with the L.C.C. what their respective functions should be, and by December, 1944, a full agreement on principle was reached. An agreement on details was also passed at a meeting of the L.C.C. in October, 1945, and it was sent to Mr. Bevan with the request that it should be included in this Bill. But at some time the Minister came to the unfortunate decision to nationalise all hospitals, including the L.C.C. hospitals, and no doubt that decision was intimated to Lord Latham, who was known not to like it at all. When the Bill was published it was found that the functions which Lord Latham, with others, had agreed should go to the boroughs had been transferred to the L.C.C. It was difficult not to suspect that there was some connexion between the two matters. "If we lose the hospitals we must have a quid pro quo, or we shall make a very serious row about losing our hospitals. Give us the functions of the boroughs which we have agreed they shall have." But whatever the explanation might be, Mr. Willink pressed the Minister to say whether he had discussed the question with the boroughs or with the L.C.C., and urged the Minister to reconsider the proposals.

Mr. KEY said that the negotiations in which he had taken part as representative of the metropolitan boroughs of London were not conducted on the basis of a real national health service. There was a case for a reorganisation of London local government. If there was a correctly set up local-government machine these health services would probably be dealt with in a different way, not only in London but in the country generally. It must be remembered that the Bill also took powers away from the county districts outside London. The amendment pretended to give a better reorganisation of the local health services, but it divorced maternity and child-welfare services, which would be given to the borough council, from the medical inspection and care of school-children, which would go to the L.C.C. as the education authority. It was a wrong principle to divorce maternity and child welfare from the continued work of child medical inspection and care. Again, Mr. Willink's proposal would divorce the maternity and child-welfare service from the midwifery service. Mr. Key knew that local authorities were already coöperating in talks to work out a scheme to secure the necessary coördination of their health services. By making the L.C.C. the authority for these purposes they would secure, despite the poverty of some areas, a proper general standard of service.

Mr. BEVAN said he had not received representations and had not met a deputation from the metropolitan boroughs or from the L.C.C. on this matter, but he had met the Association of Local Authorities. In arranging this scheme he had paid no regard to the claims of town clerks, but only to the wishes and requirements of patients and population. One of the reasons why they would never have got a health scheme from Mr. Willink was because he could not deal with the voluntary hospitals; they were too powerful for him; nor could he deal with some local authorities. The L.C.C. and the metropolitan boroughs had failed to reach even the beginnings of a solution in the London area, and when agreement could not be reached it must be imposed. He thought they had reached a proper solution. After further debate the amendment was negatived by 23 votes to 17, and clause 19 as amended was ordered to stand part of the Bill. Clause 20, containing proposals for the provision of services by local health authority, was also ordered to stand part of the Bill.

PROVISION OF HEALTH CENTRES

On clause 21 Mr. WILLINK proposed amendments, providing that the clause should read as follows:

"It shall be the duty of any local health authority as to whose area the Minister is satisfied by representations made to him by such local health authority, and after consultation with the Regional Hospital Board that such premises are required, to provide, equip, and maintain to the satisfaction of the Minister premises, which shall be called 'health centres.' . . ."

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In the Minister's white-paper, Mr. Willink pointed out, it was suggested that the health centre should be a place which provided an outpost for the hospital service. That did not appear in the clause. It was not known, Mr. Willink thought, to what extent health centres would be mainly used for general practice. The Bill providing that we must have health centres everywhere was, he thought, too universal. He was by no means certain that a rural area like Huntingdonshire was at all appropriate a place, in the present state of knowledge, for health centres. The clause, as it appeared in the Bill, made it the duty of every county and non-county borough to provide any health centres for which the Minister asked. He hoped the Minister would bring into the Bill reference to the proper jurisdiction of the local health authority in advising him whether they shall have health centres and what sort of centres they shall be. At this experimental stage the regional hospital boards should be brought in also.

The following day the committee members agreed to have a general debate on health centres on Mr. Willink's amendments rather than on the clause. Mr. LINSTEAD thought that since in this country the health centre was a new conception as a focus for health services, the white-paper tended to go too fast and too far. We did not yet know how the idea would appeal to the public. At the centre, too, the hospital service run by the regional board, the local authorities' service, and the general-practitioner service run by the local executive council, would all meet and administration might be a far from easy task. It might be a hive of industry but it might also be a hornets' nest. In the first place, he suggested, the public would probably want a private consulting-room, elaborated to modern standards, where the patient met his doctor. Close behind these would be a well-equipped diagnostic centre to which the doctor could send perhaps a quarter of his patients for a second examination. He hoped there would be a good deal of experiment before public money was directed into any particular form of centre.

Mrs. M. RIDEALGH asked whether the Minister intended that all health centres should have child-guidance clinics. Dr. S. TAYLOR declared that the health centre was the key to the general-practitioner service as constituted under the Bill. Everyone hoped that they would bring together not only groups of doctors but also groups of clinic services. Some successful general practices were already run on health-centre lines. It should not be difficult to educate the public to visit these centres, for many already visited clinics and, unfortunately, the outpatient departments of voluntary hospitals which they used as general-practitioner centres inside the hospitals. At the centre each doctor should have his own consulting-room and there should be an appointment system to obviate waiting. But the centres would have one disadvantage: the distance which patients would have to travel would be greater. To minimise this difficulty the proper siting of the centres was important. He hoped to see the educative function of the centres develop. So far doctors had not developed a public-relations sense because of their fear of advertising. That had led them to being rather sticky in talking about patients' problems, but they must take their patients more into their confidence. As a rule he hoped there would not be beds at health centres.

Captain J. BAIRD said that dentists had not yet been taken completely into the general family of medicine and had often felt isolated from the rest of the profession. They welcomed this Bill because it would give them an opportunity to work in the medical team. It was essential therefore that centres should not be only for medical purposes and that dentists should not be isolated in a dental clinic by themselves.

Dr. BARNET STROSS pointed out that, as local authorities were uneven in their outlook, unless strong encouragement was given by the Minister we might have a very unequal service. If the doctor of the future was to become a health servant rather than a sickness servant he would need additional instruments, for instance a lecture hall. But he certainly should not compete with the consultant, and the need for X-ray apparatus, operating-theatre, and beds at the centre was debatable. On the other hand there should, Dr. Stross considered, be a pathological service on the premises of every reasonable-sized centre; for we did not want the doctor to become a mere sorter of cases and inspector of human pain and suffering. Mr. MESSER pointed out that general practitioners were part of the remedial service and the local authorities were responsible only for preventive service. Might it not be wiser if the control of the centres were in the hands of the regional boards, and if necessary the local authorities would obtain permission to use the centres under the management committee of the hospital? Mr. J. S. C. REID suggested that the central council, or one of its advisory committees, might well in the early stages discuss the proper layout of these centres. There was nothing in the Bill which enabled ophthalmic services provided by anyone save a doctor to be brought into the health centre. The public would want a clear assurance that the records were not open to the whole staff of the centre.

THE MINISTER ON HEALTH CENTRES

Mr. BEVAN felt that the centres were important as the only means of breaking down the intellectual isolation of the general practitioner. Many doctors had told him how much better their work was since their work in the E.M.S. had brought them into contact with their fellow craftsmen and with specialists. But though there was no controversy about the need to establish health centres there must be experiments as to their form. We were striving to create a service which would make people healthy and not keep them sick. Unless we were careful we might create a nation of hypochondriacs. Therefore it was important to pay attention to the preventive side of medicine. At every large health centre there should be opportunities for doctors to talk to separate sections of the population about their particular problems. If we could get a stream of healthy people attending the centre it became a health centre, and the more diverse the services offered there the better the atmosphere would be. We had not yet made up our minds whether to have a centre providing a variety of services or rudimentary consulting centres nearer the people's homes, from which doctors could send their patients for more extensive examination to larger health centres. Probably in rural areas that would be the best way to tackle the problem. The more healthy the centres became the more such services as child guidance could be developed at them. But he could not commit himself to the proposition that every health centre in Great Britain would be staffed with psychiatrists of whom there was a great shortage. If guidance was to be given at the centres let us be sure that it was skilled guidance. Later the medical service of the schools would be assimilated in the National Health Service, and as that was done that branch of the service could be expanded.

It would be the duty of the local authorities, Mr. Bevan continued, to provide health centres, but the extent to which that duty was imposed would depend on the facilities which could be provided, and he agreed that the first priority must be the provision of houses and hospitals. It was intended that all V.D. services and clinics should be taken over by the regional boards. The dental clinics would certainly be at the health centres. When facilities were available he thought that everyone who had something wrong with his eyes should see an ophthalmic surgeon who would say whether he needed spectacles or some other form of treatment. If spectacles were required the eye-testing optician would provide them.

Mr. Bevan could not agree that health centres should be provided by the regional board and not by the local health authority, for the boards were much too wide and it would be administratively impossible. Hospital functions had been taken from the local authorities and he thought it was a wise provision that they should be given this new function. He agreed that many people would want to be assured that there would be complete privacy for any confidences they might repose in their doctor. There was no intention of mutilating that tradition. He pointed out that fear of lack of privacy did not prevent people from going to large hospitals where their medical history was under the observation of hundreds of different people. In the new service they wanted to avoid the patient having to go through the same painful diagnosis by different doctors because his medical history was not available. But he agreed that the medical history should go from one professional

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hand to another and should not be available for secular scrutiny.

Mr. WILLINK withdrew his amendment, saying he hoped the Minister was satisfied that the Bill gave him power to prevent an unwise authority from building six unsatisfactory centres when they should build two good ones.

THE PLACE OF THE PHARMACIST

Mr. LINSTEAD moved an amendment transferring the pharmaceutical service in the health centres from the supervision of the local authorities to the supervision of the local executive councils. The Minister, he said, had assured the pharmacists that every patient visiting a health centre would be free to take his prescription either to the dispensary in the centre or to the chemist of his choice. No influence would be used to make patients bring their prescriptions to the centre dispensary. Mr. BEVAN said he could not accept this amendment without changing the status of other ancillary staff at the health centres. The pharmacist at the hospital came under the regional board because he performed a regional service, but at the health centre he would be under the supervision of the local health authority. The necessary link between the authority and the council was provided by the fact that a large proportion of the members of the local executive council were nominated by the local health authority.

The clause was ordered to stand part of the Bill.

Captain BAIRD moved an amendment to clause 22 giving priority for dental care to adolescents, but Mr. BEVAN said it was not the statute but the shortage of dentists that was the limiting factor. As soon as we had the necessary facilities the next priority class would be adolescents. The clause was ordered to stand part of the Bill and so were clause 23 (midwifery), clause 24 (health visiting), and clause 25 (home nursing).

FROM THE PRESS GALLERY

General Medical Council

On the adjournment on June 7 Dr. H. B. MORGAN drew the attention of the House to the judicial tribunal which governs the conduct of the medical profession. The General Medical Council came into being about 100 years ago to enable the public to distinguish between the professional medical man and the untrained. This undemocratic body, with only 7 elected members out of 42, was also charged with certain duties—medical education, treating of professional conduct, and what were called the "five asinine offences." The G.M.C. was what the doctors called, Dr. Morgan declared, the "Court of Asses." Its procedure was unlike that of any other tribunal in the country. It decided what was evidence and what was not. It could discard evidence and insist on cross-examination on evidence which it had not heard orally. The members who investigated the original complaint and decided that there should be a trial also sat in judgment. The G.M.C. had a legal assessor with the right to cross-examine the accused, but counsel representing the accused, as far as was known, had no right to cross-examine other witnesses. Dr. Morgan read the following resolution passed by the council:

> "That it be delegated to the Chairman of Business, as on previous occasions, to adjust the minutes of the Council in camera arising out of the business of the session, and that the President be authorised to sign them when thus adjusted."

He suggested that this meant that the minutes of cases held in camera could be faked with permission of the council.

As the evidence before the tribunal need not be sworn, any man or woman could bring a charge against a doctor and escape the consequences. The legal assessor when summing up for the council did not advise them in public but in camera, and he examined the respondent but not the complainant. The respondent had no right of appeal to the High Court. The case could only be opened or reviewed by the G.M.C. The only sentence the council could impose was erasure from the register, but it could inflict mental torture by postponing sentence for as long as it liked.

Dr. Morgan asked for an inquiry by a royal commission or a select committee so that the present procedure by which the G.M.C. conducted its nefarious proceedings should be changed and reformed. He also asked that this should not be done in private inside the profession, for the council was not a professional but a public body. The doctors had had a hundred years in which to reform it and had not done so.

Mr. C. W. KEY, parliamentary secretary to the Ministry of Health, said he had been asked to reply by the Lord President of the Council who was the Minister ultimately responsible for questions dealing with the G.M.C. It had been accepted that some amendment of the Medical Acts was necessary and the Goodenough Committee had made recommendations about it. The General Medical Council itself had been considering the question for the past 18 months and were going to put forward some proposals. The Government intended, if it was possible to secure Parliamentary time in this session, to put forward their own proposals. It was inappropriate, he held, to hold an inquiry now because it had already been settled that the matter should be dealt with adequately. The Government wished to study the information provided and to consult the profession and the people interested, and they regarded that as a more proper method of investigation than setting up a special committee. But he assured Dr. Morgan that the points which he had raised would be borne in mind. It would, however, be unfortunate, Mr. Key continued, if the impression got about as the result of an individual case that the G.M.C. could strike doctors off the register for some slight offence. The council could only work within the powers conferred on it by Parliament, and in general it discharged its disciplinary functions ably and carefully, and with a sense of grave responsibility.

Hearing-aids

In the House of Lords on June 5 the Duke of MONTROSE asked whether the Government could give any information regarding the Medical Research Council's inquiry for the production of an improved and standardised aural aid; and what arrangements were visualised for its manufacture. Lord WALKDEN said the Medical Research Council and their three subcommittees had now completed their researches and had submitted the results to the Minister of Health, and with the approval of the Government it had been decided to adopt a complete and generous line of policy. The electric acoustics subcommittee had evolved a hearing-aid which had been tested and found to be as efficient as any now available, either British or American. Indeed it was believed that the new apparatus was an improvement on anything which had existed before. It would be supplied free (there was no question of paying £8, £10, £12, £25, or even £62) to all who needed it, when the National Health Service came into operation, probably in 1948. During the interim period the Government would do their best to arrange for the supply of the new aids, although of course there would be no authority to provide them free until the Act was passed. Every effort would be made to supply the aids at cost price to patients through the hospital services. The Government did not yet control the hospitals, but he was sure that they would be only too glad to coöperate. Facilities would also be provided for servicing the aids free of any charge except where the machine had been damaged by carelessness on the part of the patient. Clinical arrangements would also be established, chiefly in the hospitals, by which any person might have his hearing tested by a specialist. Where deafness was likely to prove amenable to treatment such treatment would be given free of charge. One of the principal aims would be the prevention of permanent deafness. Improved equipment for testing degrees of deafness would also be supplied to clinics without charge. Supplies of the new testing apparatus and new aids must be available in adequate quantities by the time the new National Health Service Act came into force, and would be provided earlier if possible. He was informed that the charge was not likely to be more than £10 for a very good aid. The Ministry of Supply were giving their assistance in speeding up production. The Government were not going to allow this invention to be exploited by anybody; it would be a State monopoly. This would bring to an end all the fraud and profiteering of the past.

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QUESTION TIME

Emergency Hospitals in Scotland

Mr. A. S. MCKINLAY asked the Secretary of State for Scotland whether he would make a statement regarding the future of the emergency hospitals built during the war and administered by the Department of Health for Scotland.—Mr. J. WESTWOOD replied: These hospitals, although intended originally for air-raid casualties, have treated large numbers of patients who were in Services or auxiliary organisations or who became the responsibility of the Ministry of Pensions. The numbers of patients in these classes are now falling, of course, but they are still substantial and they must be regarded as a first commitment. Certain classes of civilian patients have already been admitted and I propose to extend the arrangements for the admission of such patients in order that the hospitals and the special facilities they provide may serve the people of Scotland as a whole. The extent to which they can do so depends primarily on the numbers of medical, nursing, and other staff available, and I hope that the existing staffs, including members of the Civil Nursing Reserve, will continue on the new basis. The new arrangements will take some time to bring into full effect, but before the National Health Service comes into operation these hospitals should have found their proper place in the permanent hospital system of Scotland.

Accommodation in E.M.S. Hospitals

Dr. S. SEGAL asked the Minister of Health how many beds in E.M.S. hospitals had been closed by Dec. 31 last; how many would be closed down by June 30 and Dec. 30 next; and how many beds in E.M.S. hospitals would still be available for use after that date.—Mr. C. KEY replied: Most E.M.S. beds have been beds reserved in the country's ordinary hospitals, supplemented by additional accommodation. As E.M.S. reservations diminish, the beds are normally left available for ordinary use. Reservations were 47,344 on Dec. 31 last, 35,000 at May 31. I cannot forecast future figures, but they will go on diminishing.

Joint Consultative Hospital Committees

Mr. E. A. HARDY asked the Minister whether he would make it compulsory that joint consultative committees be set up in all hospitals and institutions with adequate trade-union representation on the committees.—Mr. KEY replied: In November last the Minister recommended the authorities of all hospitals and similar institutions to set up nurses' representative councils and domestic staff committees. The Minister has no compulsory powers in this matter.

Priority Foods for Invalids

Mrs. J. MANN asked the Minister of Food if he would publish a list of the physical ailments which entitled patients to priority food rations; and, in each case, particulars of the foods concerned and the amount.—Mr. JOHN STRACHEY replied: A list of the conditions for which extra foods are allowed has been circulated to all registered medical practitioners. It would not be in the general interest to publish this information which the medical profession alone can use and interpret.—Mrs. MANN: Why is it not in the general interest? Is the Minister aware that medical men are pestered by people who believe that they can get these extra rations for all kinds of diseases? Will the right hon. gentleman extend this extra ration to the wasting diseases?—Mr. STRACHEY: Our advice comes strongly from the medical profession. Our medical officers are of the opinion that this information should not be published. But I am willing to look at the matter again.—Mrs. MANN: Is it not the "yes" men in the medical profession who give this advice to the Minister?

Sir T. MOORE: Will hunger be one of the reasons?—Mr. STRACHEY: Hunger is not a disease.—Sir T. MOORE: It is a disability.

Future of the X-ray Industry

Mr. A. M. SKEFFINGTON asked the Minister of Supply who were the members of the committee considering the future of the X-ray industry; how many times the committee had met; and whether any progress had yet resulted from these deliberations.—Mr. JOHN WILMOT replied: The committee consists of: chairman, Mr. Warburton, lately director of medical supplies, Ministry of Supply; four members of the Ministry of Supply expert in various aspects of the subject; a representative of the Ministry of Health; Brigadier McGrigor, consultant radiologist to the War Office; and Dr. Russell Reynolds, radiologist. The full committee has held two meetings and a panel of the committee has held a series of fourteen separate meetings with individual firms in the industry. Further investigation of the plans of these firms is proceeding.

Rebate on Medical Literature

Mr. N. H. LEVER asked the Chancellor of the Exchequer whether he would allow doctors in public or hospital employment to charge money expended on current medical literature as an expense against taxable earnings, in view of the fact that doctors in private practice might do so.—Mr. H. DALTON replied: This would require a change in the law. I am looking into the question, but cannot, at present, make any promise.

Sleeping-sickness in Tanganyika

Replying to a question, Mr. G. HALL stated that 5372 cases of human sleeping-sickness were reported in Tanganyika during the years 1936 to 1945 inclusive, of which 2527 were fatal. Of 86 cases reported up to the end of April this year, 16 were fatal. During the last ten years 1150 sq. miles of land have been cleared of tsetse fly and 44,300 persons resettled in the cleared areas. An additional 1130 sq. miles are in course of reclamation and 550 sq. miles have been surveyed and await reclamation. A further 1200 sq. miles are in course of survey.

Nutrition Courses in West Africa

Mr. C. W. DUMPLETON asked the Secretary of State for the Colonies whether any progress had been made towards implementing the proposals arising from the visit of Dr. Platt, the nutrition expert, to West African territories last year, including the holding of a nutrition course for members of the Colonial Service in those territories, and the formation of a nutrition unit in Nigeria.—Mr. HALL replied: Trained women nutrition officers are about to be appointed in Nigeria and the Gold Coast, and one is already working in the Gambia. The nutrition unit proposed for Nigeria has not yet been formed. Attention is being given more to the establishment of a field experimental station, closely associated with the central nutrition organisation. A small party of experts is leaving shortly to examine possible sites for such a station. It is intended to hold a nutrition course, but, owing to continuing staff shortage, it seems at present unlikely that it will be possible to do so until next year.

Public Health

The Swab versus Diphtheria

THE familiar question of the relation of a positive swab to the disease diphtheria has lately been posed in an unusual form. Towards the end of August last a boy of 10 years living in a large provincial town was admitted to the local isolation hospital with a diagnosis of diphtheria. After 3 weeks he was sent home and 2 days later was seen by the family doctor. Some time in November swabs were taken at a general hospital, and the mother, hearing nothing further, again visited the general hospital, with the result that the child, early in December, was readmitted to the isolation hospital and was detained for a week. The mother was still not satisfied and more swabs were taken. Again hearing nothing, the mother appealed to her own doctor who ascertained that the swabs were positive. Because the boy was still at home with two other children the mother got in touch with a local councillor, and, at long last, the M.O.H. was invited by his committee to express his opinion. This was that he was convinced that the boy had not had diphtheria. Nevertheless, at the end of January the child was again admitted to the isolation hospital. Here he may still be, for the M.O.H. at a subsequent meeting of the committee, while reiterating his opinion, when asked why the boy was in hospital replied, "because you wanted him to be sent."

That is the story as reported in a local paper. Since no further clues to the problem are given we must rely on general principles and probabilities. The first principle, often stated in these columns, is that a positive swab is not diagnostic of diphtheria, nor does a negative report exclude its presence—the diagnosis of diphtheria is a matter for the clinician. Is it probable that, having had the child under observation for 3 weeks, the medical staff of the isolation hospital could fail to exclude clinical

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diphtheria or that they would knowingly discharge a patient carrying *C. diphtheriæ* unless the infecting strain had been proved to be non-virulent? It is much more probable that the child had tonsillitis at the time of his first admission and was also carrying the diphtheria bacillus, of which he had apparently been cleared before release. But intermittency of the carrier state is a well-recognised occurrence, as is the carrying of non-virulent strains. Clearly the child was, and may still be, a carrier of a strain and virulence unspecified. He is probably himself immune—whether naturally or as the result of prophylactic inoculations is also unknown. Usually the difficulty is to retain carriers in isolation while clearance is effected, since the M.O.H. has no legal powers of detention. Here, however, is an encouraging example of a mother who is "diphtheria-conscious"—let it be hoped to the extent of securing protection by immunisation of the other members of the family—and who, rightly or wrongly, insisted on the continued isolation of her son. Perhaps had a little more information been vouchsafed by the authorities her natural and commendable anxiety would have been relieved.

However this may be, before deciding that a child is a carrier it is necessary to ascertain, by the Schick test, the state of his immunity, and essential to determine the virulence or otherwise of the infecting strain. As to the cure of the carrier, it is imperative to segregate him from other patients suffering from diphtheria, caused by the same or other strains, in order to eliminate cross-infection; and to secure for him an abundance of fresh air. These measures in themselves may effect a cure; at least they should be given a fair trial. Usually the persistent carrier has some abnormal condition of the nasopharyngeal mucosa; and such abnormalities should be discovered and noted, although surgical interference should be the last, not the first, resort. Meanwhile, for the tonsillar carrier, in addition to the general measures, penicillin pastilles (500 units) may accelerate cure. For the nasal carrier, as a rule more obstinate, either penicillin sprays or sulphanilamide snuffs should be used with a view, primarily, to eliminating concomitant hæmolytic streptococci which when present tend to maintain the diphtheria carrier state. This done, the clearance of *C. diphtheriæ* is facilitated. But the fundamental measure is to increase the proportion of immunised children, since immune carriers among immunes play a wholly beneficent rôle by maintaining the level of antitoxic immunity among their school-fellows.

Smallpox

The cases of smallpox in Birkenhead have increased from the 5 mentioned in our issue of May 25 to 9, with 5 deaths. There have been 5 cases, 4 of them fatal, in one family. In Liverpool there have been two groups of cases since the last week of April, with 4 cases in each group, and 1 death.

Infectious Disease in England and Wales

WEEK ENDED JUNE 1

Notifications.—Infectious disease: smallpox, 2 (1 at Birkenhead, 1 at Liverpool); scarlet fever, 1070; whooping-cough, 2059; diphtheria, 304; paratyphoid, 0; typhoid, 5; measles (excluding rubella), 3931; pneumonia (primary or influenzal), 596; cerebro-spinal fever, 54; poliomyelitis, 9; polio-encephalitis, 1; encephalitis lethargica, 2; dysentery, 163; puerperal pyrexia, 135; ophthalmia neonatorum, 64. No case of cholera or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (0) from scarlet fever, 4 (2) from measles, 10 (2) from whooping-cough, 2 (0) from diphtheria, 35 (1) from diarrhœa and enteritis under two years, and 13 (3) from influenza.

The number of stillbirths notified during the week was 264 (corresponding to a rate of 30 per thousand total births), including 33 in London.

THE annual conference of the Royal College of Nursing is to be held in London from June 18 to 25. Most of the meetings will take place at the college, Henrietta Place, Cavendish Sq., W.1, but a meeting will be held at B.M.A. House, Tavistock Sq., W.C.1, on June 21, at 7 P.M., when Mr. Aneurin Bevan will open a discussion on the National Health Service.

Notes and News

THE CORONERS' SOCIETY

CENTENARY DINNER

THIS society celebrated its centenary at a dinner in London on June 6. Mr. J. CHUTER EDE, Home Secretary, in proposing its health, remarked that, though he received many letters suggesting that the office of coroner was archaic, the legislative programme of the Government was in no need of immediate reinforcement, and the coroners were safe at least for the present session. Perhaps the coroner's office needed some examination, but he thought that coroners enjoyed the confidence of the great majority of the people of the country. The society did valuable service by collecting the views of a very necessary group of practitioners, focusing them, and bringing them to the notice of the authorities. He and his advisers welcomed the assistance they received from it and its help in maintaining the coroner's court as an efficient and reliable public service.

Lord MORAN said that 260 coroners were lawyers and only 20 doctors; and as a doctor he thought this state of affairs might warrant alteration. In spite of the aid of science, doctors were constantly obliged to return open verdicts and make provisional diagnoses. The coroner was under no such handicap; he could so easily be wise after the event: all the facts—all the viscera—were on the table, and it was so much easier to attach a label to a dead body than to a living patient. Too few good jobs, he thought, were given to elderly doctors; the nation suffered through the absence of elder statesmen in medicine, and the lack of posts through which they could exercise their wisdom.

In his reply as president, Mr. C. O. LANGLEY said that a hundred years was a mere atom in the lifetime of the coroner, who had been first heard of in the 10th century. Many of the old duties of the office were still performed—for instance, inquiry into fires in the City of London, treasure trove, and the finding of Royal fish. Few laymen understood the difficulty and delicacy of the coroner's office, and the tact and patience he had to use in the knowledge that every inquest was a tragedy for someone. He suggested that, in view of the criticism sometimes levelled at coroners, it might be wise to give the society the power of keeping order in its own house, to grant it a charter with statutory power to call before it any coroner who did not conform to the usage and common practice which should be observed by all, and to report to the Lord Chancellor.

Responding to the health of The Guests, proposed by Dr. CECIL MORT, the LORD CHANCELLOR (Lord Jowitt) said he was surprised to hear that the society, instead of relying upon a benign and kindly person like himself, desired powers of discipline over its members. He wondered what Mr. Justice Charles would say to them! Sir ALFRED WEBB-JOHNSON, also responding, suggested that surgeons were like elephants, in that they never forgot, except the occasional sponge or pair of forceps, and then the coroner stepped in; but fortunately the coroner sometimes realised that the emergency was so great and the stress so terrific that the mistake was inevitable. Surgeons regarded the coroner's court as existing as much for their acquittal as for their correction. When mishaps followed their best efforts, they were glad of the opportunity to establish in open court that what they had done had been in the best interests of the patient.

FIELD STUDIES

IN 1943 the National Trust acquired Flatford Mill—Constable's mill, near Ipswich and Colchester, on the banks of the river Stour. The Council for the Promotion of Field Studies have leased it, and have now established in it their first residential centre, with room for 30 students all the year round. The council's conception of field work happily includes the painting of pictures, archæology, anthropology, sociology, and every kind of natural history—climatology, geology, botany, and zoology. Opportunities for field studies have been relatively scarce in England till now, yet they are essential in all these subjects, and the council hope to establish three or four more centres as soon as possible in various parts of the country, where such studies can be pursued.

The first centre, besides the beauty and historic interest of its site, offers great scope to naturalists in the neighbouring countryside, the salt-marsh, and the estuary of the Stour, haunted by birds of many kinds and growing many transitional types of plant between the seashore and the woods. Mr. E. A. R. Ennion has become warden, and the centre is

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open to professional research-workers, postgraduate or advanced students, adult students whether amateur or professional, classes or groups of students from school, college, university, or other educational institution (accompanied by their teachers), students attending special courses arranged by the council or other official body, and individual students beyond the level of beginners who want expert guidance. They will live either in the mill or in Willy Lott's cottage, and will as a rule carry their lunch and tea out with them, and take their breakfast and supper at the centre. The warden will arrange programmes of work, classes, and field expeditions, and special care is to be given to the conservation of wild life; collection of private specimens will not be allowed. The centre will make long-term studies, and students will be expected to help with routine observations, and in keeping full and continuous records.

Students of natural history will be well served at such a centre, but it seems likely that the student of sociology will be confined either to the historical aspects of his subject or to a study, possibly unpopular with the villagers, of life in rural communities. Perhaps the council will consider a town centre for the field study of man in his customary habitat.

The centre has been financed partly by voluntary gifts, partly by the Carnegie Trust, and by the universities and various societies; but much more support is needed if the work is to expand. The council have in mind Juniper Hall at Mickleham in Surrey, as the site of a second centre. This adventurous design for the better study of nature and man will appeal to many. Those who wish to give it active support should write to Mr. C. C. Fagg, the hon. treasurer, at 8, Addiscombe Grove, Croydon, Surrey.

M.O.H. AND G.P.

PROFESSIONAL rivalry is of two kinds, shown either in ardent striving to excel, or in envious attempts to belittle. The relation between the public-health and the general-practitioner services, while they have outgrown the second, have scarcely yet achieved the first; as Prof. Thomas Ferguson remarks in the April issue of *Public Health*, there is not yet everywhere a full measure of understanding, good will, and coöperation between these two groups of doctors. The new health service should give opportunities for uniting them at last, but can only do so if it becomes a comprehensive service of the best kind. He would welcome stronger links between the medical officer of health and all other members of the health and social services. The health centres, he thinks, may break down artificial barriers, and it is for individual health officers to establish a closer relationship with the doctors working there. Above all, he is anxious that the structure of the new service should not be rigid or uniform, urging the profession to do everything possible to ensure that the new service does not produce "a standardised, flat lump without leaven."

INSTRUCTIONAL FILMS

A SUCCINCT description of the place of films [1] in school teaching is timely and welcome. Describing first the physiological basis for the superiority of visual-and-spoken instruction over the spoken word alone, Squadron-Leader Rosenthal supports his arguments by quoting tests he has applied to men under instruction in the R.A.A.F., and finally describes the principles which underlie the proper use of films in the curriculum, the choice of apparatus, and library methods. This compact introduction will be appreciated by all medical teachers who want guidance in considering the place that films should take in medical schools.

TRANSFUSION PUMPS

APPARATUS of various kinds has been devised from time to time to aid direct blood-transfusion from donor to patient, and in some cases for transfusing stored blood or other fluids. One such machine, Henry and Jouvelet's pump, was described in our columns in 1935 by E. S. Lee and G. H. MacNab.[2] A metal cup contained a vertical roller, which rotated about a central spindle, and a loop of sterile rubber tube (conveying the blood or other fluid) which lay between the cup and the roller; and as the rubber tube was compressed each time the spindle rotated, the blood was pumped from donor to recipient. This machine, which could be worked by hand or by an electric motor, could be used for direct transfusion of blood or indirect transfusion of blood or saline, for infiltration in local anæsthesia, aspiration of effusions, artificial pneumothorax refills, and suction during operations. It was, however, somewhat cumbersome, and does not seem to have found general favour in Great Britain. An account of a small convenient 'Transfusex' apparatus serving the same purpose now reaches us from Switzerland. It is made by the Central Watch Case Co., of Bienne, and the rotary pump and the dial recording the amount of fluid transfused are enclosed in two cases, each about the size of an ordinary pocket watch, which can be strapped to the wrist of the donor or the recipient during transfusion. A mechanical check makes chance reversal of flow impossible. The makers report that they put it on the market in 1942, after several years of clinical tests, and that over 150 machines are now in use in Switzerland, and several hundred in other countries.

THE EXHIBITION AT GLASGOW

THE Medical Exhibition, which opened at St. Andrew's Hall, Glasgow, on June 10, is of more than usual interest, reviewing, as it does, the substantial progress of the past seven years since the exhibition was last held in 1939. Among the advances which have been crowded into this short time are the antithyroid substances, new synthetic œstrogens, protein hydrolysates, antiseptic detergents, D.D.T., 'Paludrine,' and the diamidines. The sulphonamides, which have multiplied and are more effective and less dangerous than their forerunners, are, of course, now partially overshadowed by penicillin. The exhibition affords the returning Service doctor an opportunity of seeing the new products and of renewing his acquaintanceship with many preparations which he used before the war. The latest medical books—still, unfortunately, scarce—are on display. In the surgical section plastics have a prominent place; among the instruments which this new industry can now supply are splints, sutures, prostheses, illuminated plastic retractors, and specula. Current research in endocrinology is reflected in the increased number of active hormonal preparations; the mass of inactive animal extracts alleged only a few years ago to be of value are being replaced by synthetic substances and active glandular extracts whose potency has been carefully assessed; but it is to be regretted that there still remain a few hormone preparations for oral administration which are known to be inactive because of their nature.

ISSUE OF LYMPH FOR VACCINATION

FROM July 1 regional laboratories will undertake the issue of lymph for vaccination, which has hitherto been the responsibility of the Government Lymph Establishment in London. With the enactment of the National Health Service Bill, the Vaccination Acts will be repealed and the office of public vaccinator will be abolished; but it is intended that this new arrangement should continue for the supply of lymph to all doctors with whom local authorities may make arrangements to provide free vaccination.

SOVIET MEDICINE

THE *American Review of Soviet Medicine*,[1] which is beginning its third year of publication, is now printed in London as well as the United States. This review, founded to acquaint the English-speaking peoples with medical progress in the Soviet Union, is controlled by a group of distinguished American physicians, which was headed by Dr. Walter B. Cannon until his death last October. The current number includes translations of original articles on anaerobic infection of the brain, the rôle of vitamins in the pathogenesis and treatment of skin diseases, and the immunisation of diphtheria carriers.

University of Cambridge

Among those on whom the honorary degree of D.SC. is to be conferred on June 24 are Dr. Charles Herbert Best, F.R.S., professor of physiology and director of the Banting-Best department of medical research in the University of Toronto, and Dr. Frank Macfarlane Burnet, F.R.S., director of the Walter and Eliza Hall Institutes for Medical Research, Melbourne.

The following degrees were conferred on June 7:

M.D.—J. N. Mills (by incorporation); James Metcalf, R. L. Lancaster, S. C. Truelove.
M. Chir.—A. G. Leacock (by proxy).
M.B., B.Chir.—J. G. Benstead, F. J. Conway.

1. Films—Their Use and Misuse. (Part I of a series—"Films in Instruction.") Squadron-Leader N. H. Rosenthal, B.A., B.SC., officer i/c of visual education, R.A.A.F., lecturer in method of visual education, University of Melbourne. Melbourne: Robertson and Mullens. Pp. 36. 3s. 6d.
2. *Lancet*, 1935, ii, 1242.

1. Published by P. Firestein, 82, King Edward's Road, Hackney, London, E.9.

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University of St. Andrews

The appointment of Dr. Robert Walmsley to the Bute professorship of anatomy at United College, St. Andrews, has been announced.

Dr. Walmsley graduated M.B. at Edinburgh in 1930, and after a year in resident posts, including six months at the Royal Infirmary, joined the university anatomy staff, on which he held appointments successively as demonstrator, university assistant, and lecturer. In 1933 he was awarded the Goodsir memorial fellowship, and in 1935 a Rockefeller travelling fellowship, with which he spent a year at the Carnegie Institute of Embryology, Baltimore. In 1937 he was awarded a gold medal for his M.D. thesis. As a territorial he was mobilised at the outbreak of war, and served with the rank of major as pathologist to 23 (Scottish) General Hospital, spending 3½ years in the Middle East. In 1944 he was recalled by Edinburgh University, and in October of that year he succeeded Dr. E. B. Jamieson as senior lecturer in anatomy. Dr. Walmsley has published several papers in collaboration with clinicians, and is the joint author of the two most recent editions of Beesly and Johnston's *Surgical Anatomy*.

Royal College of Surgeons of England

A dinner at the college on June 5 was attended by the Prime Minister, who is a Hunterian trustee, and by the Earl of Athlone.

Royal College of Physicians of Ireland

At a meeting of the college on June 6, the following were admitted members:

B. G. Alton, M.B., M. I. Drury, M.B., Bernard Moshal, M.B., H. J. Cronhelm, M.B., R. G. Cross, M.D., Sheila Sheehan, M.B., and E. W. L. Thompson, M.B.

Faculty of Ophthalmologists

The faculty, of which Sir Stewart Duke-Elder is president, has now issued its first annual report, which includes the findings of committees set up to consider school ophthalmic work and the definitions of blindness. The members number 319 and there are also 92 full-time and 58 part-time associates. Its address is 45, Lincoln's Inn Fields, London, W.C.2.

Medical Services Guild

This guild, which is the medical section of the Confederation of Health Service Employees, has recently been reconstituted. The confederation aims to unite all those engaged in the health services. Those interested should communicate with the guild's hon. secretary, 38, Argyle Square, London, W.C.1.

Socialist Medical Association

The officers of this association for the coming year are: president, Mr. Somerville Hastings, F.R.C.S., M.P.; vice-presidents, Dr. D. Stark Murray and Dr. H. Joules; hon. secretary, Dr. D. E. Bunbury; and hon. treasurer, Dr. L. T. Hilliard.

Empire Tuberculosis Conference

A conference on tuberculosis in all its aspects is to be held in London in midsummer, 1947, by the National Association for the Prevention of Tuberculosis. Representatives from the British Commonwealth and Empire will be invited, and there will also be visitors from the United States and some European countries. The conference will probably last three days.

Central Advisory Water Committee

The members of this committee, formed by the Minister of Health under the Water Act, 1945, have now been named. Mr. Henry Berry, M.P., chairman of the Metropolitan Water Board, is chairman, and various interests concerned with the conservation and use of water are represented.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Dr. Hugh Garland, F.R.C.P., 43, Park Square, Leeds, 1 (Tel. 21104).
Dr. John D. Hay, 12, Rodney Street, Liverpool, 1.
Mr. A. J. C. Latchmore, M.S., F.R.C.S., 40, Park Square, Leeds, 1.
Mr. Rodney Smith, M.S., F.R.C.S., 62, Queen Anne Street, W.1.

Dr. William Evans, physician to the London Hospital, has been appointed consulting cardiologist to the Royal Navy.

On Active Service

AWARDS

M.B.E.

Surgeon Lieutenant J. G. Reed, M.R.C.S., M.R.N.V.R.

MENTIONED IN DESPATCHES

Surgeon Lieutenant J. P. Corcoran, R.N.
Surgeon Lieut.-Commander A. P. Curtin, R.N.V.R.
Surgeon Lieut.-Commander J. A. Page, R.N.

Medical Diary

JUNE 16–22

Monday, 17th

Medical Society of London
4 P.M. (London Hospital.) Clinical meeting.

Tuesday, 18th

West London Medico-Chirurgical Society
8.30 P.M. (Kensington Town Hall.) Sir Lionel Whitby: The Magic Bullet and After.

Edinburgh Postgraduate Board for Medicine
5 P.M. (Royal Infirmary.) Dr. C. E. van Rooyen: Virus Developments.

Wednesday, 19th

Royal Society of Medicine, 1, Wimpole Street, W.1
2 P.M. *Comparative Medicine.* Mr. G. Slavin: Penicillin Concentration in the Blood and Milk of Bovines. Mr. H. Green: Outbreak of Fluorosis in Cattle. Dr. B. Malamos: Leishmaniasis in Greece. Mr. John Francis: Chick-embryo in Chemotherapeutic Research.
8.30 P.M. *Orthopædics.* Dr. Sterling Bunnell, San Francisco: Certain Aspects of Hand Surgery in World War II. Plastic surgeons are especially invited to attend.

Thursday, 20th

Royal College of Surgeons, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. Arnold Sorsby: Pure Penicillin in Ophthalmology.

Royal Society of Medicine
5 P.M. *Dermatology.* Cases will be shown at 4 P.M.

Royal Society of Tropical Medicine and Hygiene, 26, Portland Place, W.1
8 P.M. Brigadier N. Hamilton Fairley, F.R.S.: Researches on Paludrine in Malaria.

Edinburgh Postgraduate Lectures
4.30 P.M. (Royal Infirmary.) Mr. A. N. Roxburgh: Problems of a Country Surgeon. (Honyman Gillespie lecture.)

Friday, 21st

Royal Society of Medicine
8 P.M. *Obstetrics and Gynæcology.* Clinico-pathological meeting.

Appointments

Bassett, T. H., M.B. Lond., captain R.A.M.C.: M.O., Tanganyika Territory (Colonial Service).

Bell, Douglas, M.D. Edin., D.P.H.: regional tuberculosis M.O. for Aberdeen and the counties of Aberdeen and Kincardine.

Burrows, N. F. E., B.M. Oxfd: medical registrar, Hospital for Sick Children, Great Ormond Street, London.

Davies, A. G. M., M.B. Brist., captain R.A.M.C.: M.O., Tanganyika (Colonial Service).

Davies, J. H. Twiston, M.B. Camb.: dermatological specialist, medical referee for county-court districts of Accrington, Blackburn, Blackpool, Chorley, Lancaster, and Preston (circuit no. 4), Bolton, Bury, Oldham, Rochdale, and Salford (circuit no. 5), Ashton-under-Lyne and Stalybridge, Hyde and Stockport, Burnley, Colne, and Nelson, Todmorden, Rawtenstall, Congleton, and Macclesfield (circuit no. 10).

Leyshon, V. N., M.D. Lond., D.P.H.: M.O.H. and school M.O., Great Yarmouth.

Oldfield, M. W. C., M.B.E., D.M., M.Ch. Oxfd, F.R.C.S.: consultant surgeon, St. James's Hospital, Leeds.

Pierce, T. Heber, M.D. Lpool, D.P.H.: M.O.H., northern division of Caernarvonshire.

Shotton, Dorothy M., M.B. Brist., M.R.C.O.G.: obstetrician, Birmingham Maternity Hospital.

Stockings, G. T., M.B. Lond.: deputy medical superintendent, Winson Green Mental Hospital, Birmingham.

Stokoe, John, M.D. Durh., lieut.-colonel R.A.M.C.: M.O.H. and school M.O., Scarborough (subject to confirmation).

Births, Marriages, and Deaths

BIRTHS

Jones.—On May 26, at Bury St. Edmunds, the wife of Dr. E. H. Jones—a daughter.

Kershaw.—On June 3, at Leamington Spa, the wife of Dr. G. R. Kershaw—a daughter.

Macdonald.—On May 31, at Cleethorpes, the wife of Mr. C. Roy Macdonald, F.R.C.S.E.—a son.

Rob—On June 6, at Northwood, the wife of Mr. C. G. Rob, M.C., F.R.C.S.—a son.

MARRIAGES

Anwyl-Davies—Counsell.—On June 6, in London, Thomas Anwyl-Davies, M.D., to Doris Elizabeth Counsell, M.R.C.S.

Darlow—Ellis.—On June 4, in London, Henry Mark Darlow, surgeon lieutenant R.N., to Daphne Gertrude Ellis, Q.A.R.N.N.S.R.

DEATHS

Betenson.—On June 6, at Kew, Surrey, Woodley Daniel Betenson, M.R.C.S., D.P.H., formerly assistant medical officer, Port of London, aged 77.

Earle.—On June 5, at sea, Herbert Gastineau Earle, M.B. Camb., LL.D. Hong-Kong, director of the Henry Lester Institute, Shanghai.

Instone.—On June 2, Bradney Instone, M.R.C.S., of Chalfont St. Peter and Addison Road, Kensington.

Johns.—On June 4, at Amersham, Samuel Henry Mannings Johns, M.B. Camb.

Ligertwood.—On June 3, at Bracon Ash, Norfolk, Charles Edward Ligertwood, D.S.O., M.D. Leeds, of Milverton, Somerset, aged 73.

Meade-Waldo.—On May 30, in Palestine, in a road accident, Edmund Timothy Gurney Meade-Waldo, M.B. Camb., captain R.A.M.C., aged 25.

Taylor.—On June 6, in London, James Taylor, C.B.E., M.D. Edin., F.R.C.P., aged 87.

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POPULATION *

A. S. PARKES
Sc.D., F.R.S.
NATIONAL INSTITUTE FOR MEDICAL RESEARCH, HAMPSTEAD

THE study of population, or demography, must concern itself with politics, religion, sociology, psychology, biology, and statistics. This is an explosive mixture, and demography is consequently a highly provocative subject. Discussion, however, should be welcomed, since nothing is more closely associated with the welfare of mankind, either as a cause or as a symptom, than quantitative and qualitative changes in population.

In the past the prospect of overcrowding has been the chief nightmare of the student of population. Today we are faced with a problem of a different kind. A few years ago it became widely realised that the great efforts then being made for national survival would be more or less vitiated if we proceeded afterwards to abolish ourselves. In 1943 the Royal Commission on Trends of Population was set up. This commission is supported by three expert committees—statistical, economic, and biological and medical. I do not know what progeny the first two may have had; the biological and medical committee, through the commission, can call on a special committee of the Royal College of Obstetricians and Gynæcologists for clinical investigation, and on a special committee of the Medical Research Council for laboratory investigation. From all this it will be seen that, whatever may be the state of the man and the woman in the street, the commission itself is fertile enough, having given rise to two generations of offspring in two years.

The first act of the commission was to call for facts. And here I may point out one of the peculiarities of the study of population—namely, that what facts there are, being mainly numerical, are well authenticated, but there is an astonishing lack of information on many fundamental points. For instance, we do not know the average size of family in Great Britain at the present time. The survey recently carried out on behalf of the commission was directed towards the solution of this elementary point.

GROSS POPULATION

What then are the facts available? As is well known, the population of Great Britain—England and Wales, and Scotland—is about 45 million. This size of population is of comparatively recent growth. At the beginning of last century, when the ten-yearly census began, the population was a little over 10 million. No accurate figures exist for earlier times, but the population is estimated to have been about 6 million in the seventeenth century, about 2½ million in the fourteenth century, and about 1½ million at the time of the Domesday survey, twenty years after the Norman conquest. In general, therefore, the population of these islands during a thousand years has increased in a logarithmic curve.

It was this well-known tendency of animal populations to multiply at an ever-increasing rate to the very limit imposed by environmental factors which alarmed Malthus and gave basis to his warning that with unrestricted reproduction there would always be a substantial proportion of the population in want. Malthus died before the spectacular increase in population in the second half of last century, and he must be credited with having shown considerable prescience. This increase was coincident with the industrialisation of the country and with the concentration of the bulk of the population into towns. The three events were correlated, to the extent that the increased population could not have been supported without the industries which enabled food to be purchased from abroad; and there is some evidence that the herding of people into towns greatly facilitated the increase in the birth-rate.

Fig. 1 shows that at the end of last century the population had doubled in fifty years and was still increasing rapidly. In the next forty years there was further growth of the population, but the rate of increase had fallen off considerably. Assuming that the present birth-rate and death-rate are maintained, it can be calculated that the population of Great Britain will cease to increase about 1970. Superficially, this might appear to be a very good thing, and it is possible to make a case for the idea that this country needs a stable and perhaps a smaller population. Unfortunately, this rosy view is not quite relevant. With present trends, the population will not stabilise; after 1970 it will start to decrease, and, before the war, one of our leading demographers expressed the view that within a hundred years the population of Great Britain might well be down to a quarter of the present figure. Other estimates have been still more pessimistic. Moreover, the age-composition of the population is already unbalanced, and will become much more so. In other words, gross numbers are no indication that a population is demographically sound, and various separate factors must be examined. The first of these is birth-rate.

BIRTH-RATE AND REPRODUCTION-RATE

In England and Wales the birth-rate reached its peak of 35 per 1000 in about 1870, after which it fell continuously (fig. 2). The decline in the 1920's is particularly noticeable, and in 1938 the rate was only 15·1 per 1000. These figures, though startling enough, do not really tell us very much about how the population is replacing itself. For instance, if people begin to live longer, the birth-rate calculated in terms of births per 1000 of the population will automatically fall, even if the annual production of babies remains the same. Another index, the net reproduction-rate, must therefore be used. This index tells us how many female offspring are left by each woman, allowing for the mortality of females before the end of the childbearing period—i.e., it tells us to what extent a female is replacing herself by another. This is a true index of the extent to which the population is replacing itself. A net reproduction-rate of 1·0 means that replacement is exact; a rate below 1·0 is below replacement level; a rate above 1·0 is in excess of replacement. A rate of 2·0 would mean that the population doubled itself every generation.

In 1880 the net reproduction-rate in England and Wales and Scotland was far above the replacement level of 1·0. Since then it has fallen almost continuously, especially during the 1920's. In England and Wales it was down to 0·805 by 1938 (fig. 3). In other words, the population was very definitely failing to maintain itself. In Scotland, on the other hand, the rate was only slightly below 1·0, and the Scots were, therefore, maintaining their population better than the English and Welsh.

EFFECTS OF WAR

Figs. 2 and 3 are constructed from period averages. They do not, therefore, bring out the curious effect on the birth-rate of both the great wars in this century. During the war 1914–18 there was an initial rise in the birth-rate followed by a decline. Immediately after the war there was an even greater rise, followed by a greater fall. During the recent war the birth-rate rose again, and it will be most interesting to see if a post-war rise occurs again in the next year or two. The increase in the birth-rate after 1939 raised the reproduction-rate to about 0·9, and the position is therefore better than it was. It is far from certain, of course, that the

* Substance of a lecture given at the National Institute for Medical Research on Dec. 6, 1945.

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improvement will be maintained when the effects of the war have worn off.

It is impossible to assign a definite reason for this increase in the birth-rate associated with wars, which is the more remarkable when one considers the prolonged absence abroad of many men of reproductive age. No doubt a multitude of factors, mainly personal and psychological, are concerned. The biologist might say that anything that makes life more primitive will put emphasis on a primitive function such as reproduction. A cynic might say that among the horrors of total war the horrors of marriage and parenthood are reduced to their right proportions.

Another remarkable effect of war is seen in the changes in the sex-ratio at birth—i.e., the proportions of males and females born. For many years before the war 1914–18 the number of males born per 100 females fluctuated very slightly round 104. By 1916 it was 105, and by 1919 it was 106. Similar changes took place in Germany and other countries involved. By 1923 the ratio was back below 105, where it stayed till 1939. In 1942 the figure was above 106, the highest ever recorded. Similar facts have been recorded for other wars. This might appear like a providential mechanism for restoring the males lost in war. It is most probably due to earlier marriage, coupled with the increased proportion of males born to young parents.

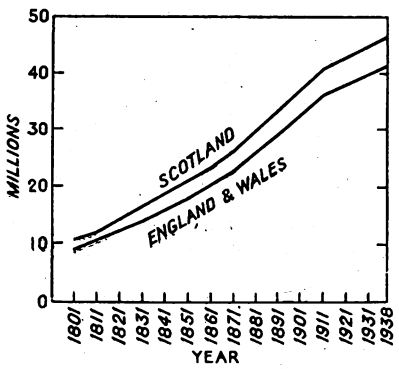

Fig. 1—Growth of population of Great Britain 1801–1938.

DEATH-RATE

If the birth-rate has been falling for seventy years, why is the population still increasing? The answer, of course, is to be found in the reduction of the death-rate over a similar period (fig. 2). Had the death-rate of 1871 been maintained, it would have begun to exceed the birth-rate during the 1920's, and the population therefore would by now have been declining for some twenty years. Fig. 2, however, shows that the death-rate has fallen to about half what it was in 1871. Conversely, the expectation of life at birth has increased from about 45 years to about 65 years (fig. 4). The reduction in mortality applies at almost all ages, and two very interesting consequences have ensued. The first of these, which is demographically advantageous, concerns the tendency towards a greater mortality among males. This tendency, when there is a high infant mortality, means that the excess of males at birth is rapidly dissipated and leads to an excess of females of reproductive age. This excess is greatly increased by war, which takes a highly differential toll of men of reproductive age. Before the war 1914–18, there was an excess of about 600,000 women over men aged 20–45.

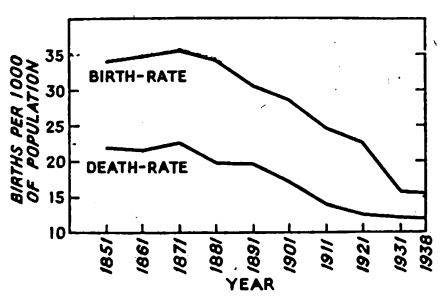

Fig. 2—Birth-rate and death-rate of England and Wales 1851–1938.

In 1925 the excess was well over a million. This kind of discrepancy must clearly depress the birth-rate, and in passing one cannot help registering, on biological grounds, a protest against a social system which, taken at its face value, sterilises a million women. Happily, the steady decrease in child mortality, which has decreased the differential loss of young males, has already gone far to abolish the inequality of the sexes at reproductive ages. Moreover, since the casualties of the war 1939–45 were far less heavy than those of 1914–18, the disturbance to the proportions of the sexes at reproductive ages will be correspondingly less in the next decade than it was in the 1920's.

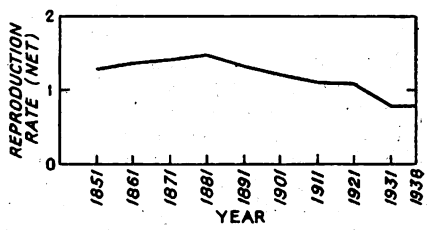

Fig. 3—Net reproduction-rate of England and Wales 1851–1938.

AGE-DISTRIBUTION

The second effect of the falling death-rate, in conjunction with the falling birth-rate, has been a very remarkable alteration in the age-distribution of the population. With a high birth-rate and a comparatively short expectation of life most of the population will be youngish people, as in 1870 (fig. 5*a*). With a low birth-rate and a long expectation of life the centre of gravity of the age-distribution will be much higher. During the change-over from the first position to the second position the situation will be aggravated by the survival, into the days of low birth-rate, of a lot of old people born in the days of high birth-rate. We are now entering such a transition period (fig. 5*b*).

Men over 65 and women over 60 were 6% of the population in 1901, 12% in 1941, and will be 21% in 1971. Some of the economic implications of this change can be indicated very easily. The white-paper on National Insurance estimated that in 1946 there would be 15 pensioners per 100 contributors, but that in 1970 there would be 32 pensioners per 100 contributors. Such an increase, other things being equal, must reduce the standard of living either of the contributors or of the pensioners. Is there a way out of this economic dilemma? Short of some fantastic happening, the age-distribution of adults in the next twenty-five years is already settled within narrow margins and cannot be altered. The only obvious remedial measure is for the old folk to work† beyond 60 or 65.

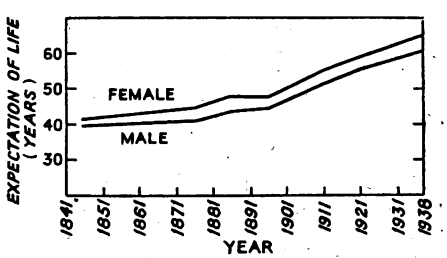

Fig. 4—Expectation of life in England and Wales 1841–1938.

Here several interesting points arise. I have already said that since 1870 the expectation of life has risen from 45 years to 65 years; does this mean that a man or woman aged 65 is now as mentally and physically fit as one aged 45 was then? It is difficult to say, but the answer is probably no, because seventy years ago there must have been a considerable tendency for

† In speaking of work, I am thinking primarily of work which is normally rewarded by a wage or salary, but I have not forgotten that much useful and essential work is performed without such reward, as, for instance, by retired people, but especially by housewives.

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people to be swept off in their prime by diseases, &c., which can now be overcome. On the other hand, we are now getting a much more rational idea of what constitutes the state of being too old to work, and we realise that the age at which one becomes too old for a job depends partly on the person and partly on the job. A fighter pilot, for instance, probably becomes too old for the job at 30, while at the other end of the scale the artist and author, for example, can ply their trade at their own speed until they become completely gaga, or even after.

All this leads up to the question of how to find out when anyone is too old for a job and how to retrain them for a job more suited to their current mental and physical condition. The former is primarily a matter of working out standards of necessary performance, and is clearly not an easy problem. I am sure, however, that many employers, including the Medical Research Council, would like to know the answer. As regards retraining, it is usually said that only the young can learn easily —you can't teach an old dog new tricks. But it would be much more accurate to say that you can't teach an old dog by the same methods as you teach a young dog. It is satisfactory to know that this subject is receiving increasing attention from experimental and industrial psychologists.

It is clear that the medical scientist has incurred a grave responsibility in creating vast numbers of old people without at the same time finding out what to do with them, and that a further increase in longevity without a corresponding increase in the duration of working capacity will have serious results. Even in present circumstances the idea of a fixed retiring age for all types of work is in need of revision, an odd state of affairs to come so closely on the heels of the struggle to obtain reasonably early retirement on pension.

A POPULATION POLICY

This country has never had a population policy, and it is evident that the finding of the royal commission should be used as the basis of a policy. It seems to me that the first object of such a policy should be to ensure a reproduction-rate of 1·0 and so stabilise replacement. This will not in itself stabilise the population until the expectation of life is stabilised, and this is not yet in sight. The increasing expectation of life is a serious complication in any policy designed to effect an immediate reduction in the population. On the other hand, a decrease in population as an ultimate aim, when some kind of stabilisation has been effected, might be a rational policy.

Speaking of a population policy immediately raises the question of how a policy is to be effected. It is unlikely that the spontaneous war-time increase in the reproduction-rate will be maintained, and to raise the level to 1·0 and keep it there may well require positive measures to encourage families. What can such measures be? There is little evidence that medical factors have been primarily responsible for the decline in the birth-rate; rather the reason must be sought in a disinclination to have large families, coupled with increased knowledge of how to avoid them. And here I may point out that the fall in the birth-rate after 1921 was associated with a steady increase in the marriage-rate.

Obviously I cannot embark on a discussion of how to overcome this disinclination to have children. I will only say that the politicians and others concerned should see to it that conditions of life are such that people will be willing to have, and will feel justified in having, children. One very practical step would be to remove, so far as may be, the economic and social disadvantages attendant on rearing a family. The proposed family allowances are a step in the right direction, though one which will be of very little use to the hard-pressed middle classes. It should be remembered, however, that economic encouragement of parenthood was tried fairly extensively in Germany and Italy in the 1930's and did not prove strikingly effective.

Finally, I want to enter a plea that we should consider the quality as well as the quantity of the population. The decline in the birth-rate has been highly differential between different sections of the community. Among all classes the better stock, acutely conscious of its responsibilities, tends to have smaller families than the careless and irresponsible elements. At the extreme end of the scale, people of subnormal intelligence are notorious for their fertility. The fundamental facts of heredity are as applicable to man as to animals and plants, and it is clear that the differential birth-rate, if it continues, will have a serious effect in lowering quality. Under natural conditions much of the low-quality material would automatically be weeded out; present tendencies are all against any such selection. I sometimes wonder whether the idea that the State should take ultimate responsibility for every child born is compatible with the present lack of control over what is born. For those who welcome unlimited State control a theoretical solution to this dilemma is easy—control of marriage and propagation. For those who cannot bring themselves to favour such interference with the individual the answer is difficult.

THE FUTURE

I have painted rather a gloomy picture, but perhaps we can console ourselves with the thought that evolution marches on. The history of the human race is the history of the rise and fall of civilisations. Within historical times at least three civilisations have risen and fallen in the west. Within comparatively recent times great powers have sunk into obscurity, and a nation born only two hundred years ago dominates the world today. In the same way the history of life is the history of the rise and fall of different kinds of animal, and it is not certain that the human species, even with its growing control over natural forces, will achieve any great permanence viewed against the background of biological history. The enormous reptiles of the mesozoic period faded away because they evolved too far in the direction of mere brawn. Is it possible that the macrocephalous mammals of the neopleistocene era will fade away because they evolved too far in the direction of mere brain?

I am most indebted to Dr. D. V. Glass and to Dr. C. P. Blacker who read the manuscript of this lecture.

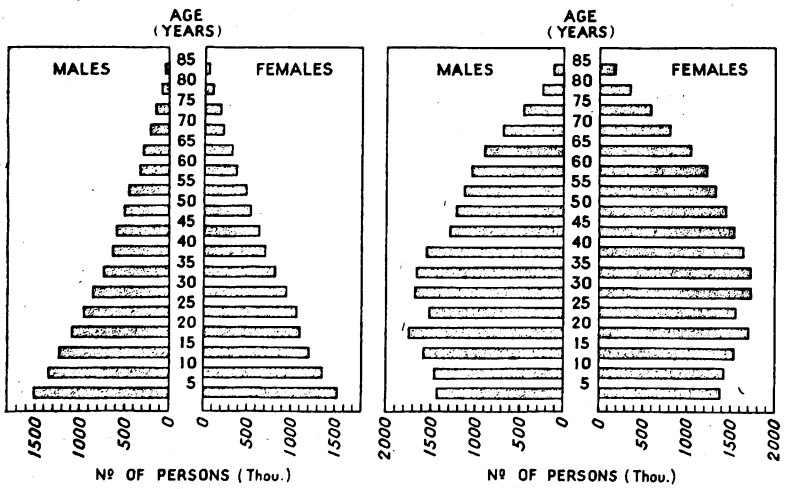

Fig. 5—Age-distribution and sex-distribution in England and Wales: (a) in 1871; (b) in 1938.

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GONORRHŒA IN THE FEMALE

DIAGNOSIS AND TREATMENT

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THE purpose of this paper is to record some facts and figures relating to gonorrhœa in Service women admitted to a military hospital during the period from January, 1942, to June, 1945, and to discuss the false impressions relating to this subject which seem to exist in the minds of some colleagues.

The number of cases of proved gonorrhœa admitted was 266; of these, 131 were gonorrhœa alone and 135 gonorrhœa with trichomonas vaginitis. A large majority of the patients were in their early twenties, and most were unmarried; hence the clinical picture differed from that found in the ordinary gynæcological clinic, where infected patients are usually older and in many cases have some complicating gynæcological condition.

REPORTING OF CONTACTS

Most of the patients were sent for investigation because of symptoms suggesting genital infection, but a considerable proportion were referred to the department because it was alleged that male partners had been infected. In military as in civil practice emphasis is at all times laid on the necessity of obtaining information about infecting partners and bringing these under investigation. When the source of infection is believed to be a member of the women's Services, the infected man can usually give enough information for the consort to be identified and admitted to hospital. Notification is made through medical channels with the minimum of publicity, and in general the women concerned show very little resentment and are most anxious to have the whole matter investigated. They are entitled to refuse examination, but such refusal after admission to hospital is so rare that it has only occurred as a result of some psychiatric disorder.

The efficiency with which this system worked may perhaps be taken as a model for civil life, where medical officers of health must usually take unofficial action without the second notification required by Defence Regulation 33B to bring infected consorts under treatment. The opponents of notification contend that the practice of notifying sources of infection is dangerous, because accusations may be made for blackmail or with other malicious intent. It is difficult to regard this as a serious danger, and certainly there was never a suggestion or suspicion of malicious wrong information in this group of cases. On the other hand, incorrect information may occasionally have been given in good faith. In table I details are given of 116 women notified in this way. As the result of this procedure 81 cases of gonorrhœa, 10 of syphilis, and 20 of other conditions of the genital tract were brought under treatment; 5 women were found to be free from venereal or other disease of the genital tract, but only 1 of these denied that the alleged contact had taken place.

SYMPTOMS

The symptoms of gonococcal infections may be obscured by those of trichomonas vaginitis, which are characteristic and often of considerable severity (King et al. 1936). For this reason the symptoms of patients found to have gonorrhœa alone are shown in table II separately from the symptoms of those in whom gonorrhœa was complicated by trichomonas vaginitis.

Of the 131 patients with gonorrhœa alone, 56 had either no symptoms or symptoms so slight that they did not consider them abnormal; 54 had vaginal discharge with, in some cases, lesser symptoms; and in 21 the patient's attention was attracted by various combinations of symptoms. Of the 135 patients with complicating trichomonas vaginitis there were 34 without appreciable symptoms, and vaginal discharge was the presenting symptom in 91. Therefore of the 266 patients proved to have gonorrhœa 90 regarded themselves as symptomless and would not have come under investigation and treatment but for accidental circumstances or the fact that they were reported as being sources of infection.

Medical officers working in this special subject are well aware that the disease is often latent in women, but some doctors without such special experience seem to be unaware of the fact. In clinics for venereal diseases, both military and civil, much time, tact, and energy are expended in impressing on patients the necessity for wives or consorts to seek medical advice. Naturally, many of these women elect to consult their own doctors, but it often happens that the advice given is that further action is unnecessary because there are no symptoms. The possibility of symptomless gonococcal infection in the female, therefore, is one which must constantly be borne in mind.

SIGNS

The signs of gonorrhœa in the female are fully described in current textbooks and require only brief review here. The common sites of infection are the urethra and cervix, and in recent acute cases the signs are usually clearly marked. The urethra shows pus at the external meatus; or, if not, pus can usually be expressed by pressure on the urethra from behind forwards by the examining finger within the vagina. The patient should not have passed urine for at least three hours before this examination. Erosion of the cervix is commonly present, and the normally mucous secretion of the cervix is purulent or mucopurulent. Inspection should include Bartholin's glands, the orifices of the ducts, and Skene's tubules. Two other sites of infection are commonly involved —the fornices of the vagina (King and Mascall 1935) and the anal canal—and these should always be examined.

When the infection is of some standing, the signs are apt to be indeterminate and may vary from day to day or according to the stage of the menstrual cycle. Clinical signs of infection may be minimal or absent; but their absence should never be accepted as proof that there is no gonococcal infection. Full bacteriological tests are essential in all cases where the suspicion of infection arises. This point has been emphasised by Strauss et al. (1943), who examined 81 prostitutes in whom gonorrhœa had been diagnosed by positive culture and who had received no treatment; 57 of the women had no clinical signs on admission, but on repeated examina-

TABLE I—RESULTS OBTAINED IN THE EXAMINATION OF 116 WOMEN CITED AS CONTACTS BY MEN WITH VENEREAL DISEASE

Disease of male consort	Women examined	Diagnosis	Cases
Gonorrhœa	90	Gonorrhœa	51
		Gonorrhœa and trichomonas vaginitis	30
		Trichomonas vaginitis	6
		Non-specific cervicitis	2
		No abnormality	1
Syphilis ..	17	Syphilis	10
		Trichomonas vaginitis (still under investigation)	2
		Non-specific cervicitis ..	1
		Pregnancy	1
		No abnormality	3
Non-specific urethritis	5	Trichomonas vaginitis	2
		Non-specific cervicitis	3
Particulars not known	4	Trichomonas vaginitis	2
		Non-specific cervicitis	1
		No abnormality	1

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TABLE II—ANALYSIS OF (A) 131 CASES OF GONORRHŒA ALONE; (B) 135 CASES OF GONORRHŒA PLUS TRICHOMONAS VAGINITIS

A				B			
Reason for reporting	Cases	Other* symptoms	Cases	Reason for reporting	Cases	Other* symptoms	Cases
Contacts	54	None	37	Contacts	33	None	17
		Vaginal discharge†	16			Vaginal discharge†	16
		Dysuria	2			Dysuria	1
After alleged assault	2	None	2	Vaginal discharge	91	Irritation	28
						Dysuria	13
						Abdominal pain	5
Vaginal discharge	54	Dysuria	12			Menorrhagia	1
		Abdominal pain	5				
		Vulval irritation	4	Menorrhagia	1	Vaginal discharge (slight)	1
		Menorrhagia	2				
				Dysuria	4	Vaginal discharge (slight)	2
Menorrhagia	5	Vaginal discharge	1				
		Vulval warts	1	Abdominal pain	3	Menorrhagia	1
Dysuria	2	Vaginal discharge	1			Vaginal discharge	2
						Dysuria	1
Abdominal pain	11	Vaginal discharge	10	Vulval irritation	1	..	..
"Sores" (syphilitic)	2	Slight vaginal discharge	1	Examined for diagnosis of pregnancy	1	None	1
Warts (condylomata acuminata)	1	Slight vaginal discharge	1	Backache	1	..	..

* Symptoms in column 1 are omitted.
† Usually slight and not considered abnormal by the patient.

tion 69 of them were found to have either moderate or profuse mucopurulent discharge from the cervix.

BACTERIOLOGICAL TESTS

It is essential for smears and cultures to be taken from urethra and cervix in all cases and this is routine procedure in all well-conducted clinics. If negative, these tests should be repeated on several occasions. Similar specimens should be taken from other sites of potential infection, if clinical examination gives rise to the suspicion that these sites are infected.

The paramount importance of cultures in the diagnosis of gonorrhœa in the female has been emphasised many times by writers on the subject, and for many years has been taught at the main centres for the diagnosis and treatment of venereal diseases in this country. Harrison (1924) wrote of gonorrhœa in the female:

"Every known means, including cultural tests, should be adopted to discover the micro-organisms in the hope that, if one fails, the other may succeed. . . . The difficulty of discovering the gonococcus makes it necessary, in the event of negative findings, to repeat the examination a number of times."

It is surprising, therefore, to find the following in a recent reference to the subject by Lloyd (1945):

"The diagnosis in the earlier cases was made by smears only, but, on the recommendation of the American Neisserian Society, cultures of the cervical pus were made. This is said to lead to more positive diagnosis, but in the present series positive cultures were obtained only if positive smears had been reported."

The fact is that cultural tests for gonococcal infection were almost unknown in the United States ten years ago; but in recent years there has been a great increase in interest in this subject; and, judging by reports, the technique of cultivation of the gonococcus has reached a great pitch of accuracy in many centres. The reports from this source provide an overwhelming volume of evidence on the absolute necessity for a good cultural technique in the diagnosis of gonorrhœa in the female.

Lankford (1941) records the examination of 1107 patients with various gynæcological conditions. In 251 (22%) the gonococcus was found. In these cases there were 485 positive tests, of which cultures were positive in 437 instances and smears positive in 166 instances. In only 12 tests were smears positive and cultures negative.

Jacoby (1943) refers to the examination of 5303 prostitutes arrested in New York City in 1941. In 112 patients smears alone were positive for gonococci; in 617, cultures alone were positive; and in 323 both smears and cultures were positive.

Strauss et al. (1944) record the following results in 281 female patients with gonorrhœa: 54 were diagnosed by positive smears and cultures, 18 by positive smears only, and 209 by positive cultures only.

There are many similar reports, and the superiority of cultural tests over smears has been so well demonstrated to the satisfaction of the American workers that some of them are disposed to regard smears as unnecessary and a waste of time in all but acute cases. In fact, it is suggested in some quarters that the standard test of ten years ago is so unsatisfactory that it should be abandoned altogether.

Our own results in cases examined by smear and culture are as follows:

No. of cases of gonorrhœa	266
Diagnosed by smear only	85
Diagnosed by culture only	56
Diagnosed by smears and cultures	125

In all cases "doubtful" smears were recorded as negative—i.e., no smear was accepted as positive unless the typical intracellular gram-negative forms were seen. The decision was in the hands of an experienced clinician accustomed to reading such smears daily. Most general pathologists are faced with this particular problem less often, and in consequence their judgment is apt to be less accurate than that of the clinician on the spot.

In our cases the proportion diagnosed by cultures alone was smaller than that diagnosed by smears alone. This is contrary to the opinion expressed above and to recent experience recorded by others. The fact is that the technique of cultivation of the gonococcus is difficult and requires considerable experience. The pathologist who has not made a special study of the subject, however skilful he is in other branches of his work, often fails in this testing task. Furthermore, pathologists who are experts at this particular work sometimes produce batches of media which are relatively ineffective. War-time conditions may have contributed to the difficulties of media making; thus Price (1945) believes that failures have resulted from the poor quality of the meat from which the broth is made. The general standards of culture of the gonococcus will probably not be high in this country until the commercial media available are brought to the pitch of efficiency reached by similar products in the United States and are more widely used.

In 3½ years in a war-time military hospital pathologists came and went, and inevitably the standards of this particular work varied a good deal. The relative inferiority of our cultural tests was at any rate partly due to these frequent changes of personnel.

Strauss et al. (1943) were called on to treat cases of gonorrhœa in women in which the diagnosis had been made by positive cultures before admission. In 1940, cultures taken from a series of such patients before treatment showed only 35% of positives, but this was increased to 50% on repetition. In 1941, 55% of positives were obtained on repeated examination of cultures of a similar series.

Cohn and Grunstein (1944) found that cultures were far more accurate than smears. They tested 230 patients attending a gynæcological clinic and obtained positive results in 91. They estimated that more than half the positive cases would have been missed had the diagnosis depended on smears alone. Nevertheless they found limitations in bacteriological tests, including cultures, which they could not completely explain. In the advanced acute stages of the disease both smears and cultures fluctuated from positive to negative and were unreliable. They concluded that this might be due either to lack of sensitivity of present culture media or to temporary or persistent latency of the disease.

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The cultural method, therefore, is a valuable and indeed essential test in the diagnosis of gonorrhœa in the female. In cases of difficulty it may be necessary to repeat the test six or eight times, or even more, before a positive result is obtained, even when the best standards of cultural technique are available.

Failure in cultural tests is usually due to an ineffective medium, but may also be due to faulty technique in taking specimens, resulting in contamination. For this purpose the slender easily sterilised platinum loop is much to be preferred to the bulky wool or gauze swabs commonly used. Failure to keep the medium at the right temperature before and after inoculation may be a source of error, so an incubator should be maintained at the required temperature (35°–37° C) in the department where tests are taken. Our practice was to place culture plates in such an incubator 30 min. before use and to replace them in the incubator immediately after inoculation, until the specimens were collected by the laboratory staff.

In the light of this experience some current practices are evidently dangerous. Mention has been made of the practitioner who disregards the possibility of gonorrhœa in his patient because, although reported to him as a possible contact, she is symptomless. It is also common experience that a woman patient attends a centre for venereal diseases at the advice of husband or consort and is passed as free from infection on the strength of slight or absent physical signs and of one series of negative bacteriological tests, which may or may not include cultures. The repercussions of the missed case on the individual, the family, and the public health can be serious. Some cases will probably be missed even with the most careful technique; but it is unfortunate that this dangerous group should be made more numerous by lack of knowledge of the elementary facts.

TREATMENT

During the period under review there was a good deal of variation in the precise details of treatment, depending on the availability of the various drugs used and on current experience in male patients, with whom, owing to their greater numbers, more rapid assessment of the value of these drugs was possible. In table III the various schemes

TABLE III—IMMEDIATE RESULTS OF TREATMENT

	Sulphapyridine	Sulphathiazole			Penicillin
Series ..	1	2	3	4	5
Dosage..	4·5 g. for 5 days	6 g. for 3 days	8 g., 6 g., 6 g.	4 g. or 5 g. for 5 days	100,000 units
Cases ..	77	110	44	9	26
Group A	72 (93%)	94 (85%)	38 (86%)	9 (100%)	24 (92%)
Group B	3 (4%)	12 (11%)	4 (9%)	..	2 (8%)
Group C	2 (2·5%)	4 (4%)	2 (5%)	..	..

Group A: recovered with one course.
Group B: recovered with two courses.
Group C: requires further treatment after two courses.

of treatment adopted are enumerated, and the immediate response to treatment is assessed by means of the following arbitrary classification:

Group A: patients requiring no further treatment after the initial course.

Group B: patients requiring a second course of treatment, which resulted in a successful outcome.

Group C: patients requiring further treatment after the second course.

It should be emphasised that these are only the initial results of treatment, and success means subsidence of clinical symptoms and signs, with immediate negative bacteriological findings. The results of further tests and "follow-up" are shown in table IV. No distinction is made between patients suffering from gonorrhœa alone and those in whom trichomonas vaginitis was a complication. The latter infection appeared to run its own independent clinical course, its treatment and response

TABLE IV—ULTIMATE RESULTS OF TREATMENT

Series.. ..	1			2			3			4			5		
Group	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Tests of cure ..	38	..	..	57	7	2	19	2	..	4	..	..	4	..	..
Relapses (gonococcus present)..	5	..	..	4	1	..	1	..	..	..	..	..	..	..	..
Untraced	29	3	2	33	4	2	18	2	2	5	..	..	20	2	..
Totals	72	3	2	94	12	4	38	4	2	9	..	..	24	2	..
Grand total ..	77			110			44			9			26		

to treatment being quite dissociated from those of the gonococcal infection.

Patients treated with penicillin received no local treatment. To most others, apart from those treated for trichomonas vaginitis, the only local treatment given was daily insufflation of the cervix and vaginal wall with powdered sulphanilamide; local treatment was, however, withheld from pregnant patients. Insufflation appeared to be an effective accessory method, but results were carefully watched in view of two possible dangers. The first was that absorption of an undetermined amount of additional sulphonamide from the vagina, added to that given by mouth, might increase the toxic effects of the drug, particularly on the blood-forming tissues; there was no evidence of this in any case, but total and differential white-cell counts were done as a routine before instituting a second or further course of treatment. The second possible danger was from local sensitisation effects like those described in the treatment of skin conditions by Tate and Klorfajn (1944); but no instance of this was found in this series.

The patients shown in table III as treated with penicillin received this drug as their initial treatment. In addition, 6 other patients were treated with penicillin but were not included under that heading because they had received previous treatment and were sulphonamide failures. Two of these responded to penicillin, 100,000 units in one case and 200,000 in the other, after failure from one course of sulphathiazole consisting of 8 g., 6 g., and 6 g. on successive days. In this series (no. 3 in table III), therefore, these two cases upset the proper balance between groups B and C. Three other patients treated with penicillin had not reacted to two courses of sulphathiazole, and one had relapsed. Patients given a second course of penicillin received 200,000 units. All injections of penicillin were given intramuscularly, and two schemes of treatment were used: injections of 10,000 units hourly after an initial injection of 20,000 units; and five injections of 20,000 units at two-hourly intervals.

TEST FOR CURE

Enough has been said about the difficulties and failures of diagnostic tests to make it clear that their margin of error is likely to be greater in treated than in untreated cases. Judging by experience with men, where the assessment of cure is less difficult, the figures shown for immediate success flatter the methods of treatment used. In all cases action was taken to ensure that the patients concerned would have three months' observation, with full examination and bacteriological tests shortly after each menstrual period. It has been held generally for some years that in cases of latent infection when gonococci are hard to find the prospect of finding them is improved at this stage of the menstrual cycle.

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This view has been challenged by Lewis (1943), but in the absence of detailed studies it remains sub judice, and the practice of taking tests at that time is continued.

ULTIMATE RESULTS

Owing to various difficulties follow-up is not complete in this series. Attempts have been made to obtain information in every case, but many patients have returned to civil life under the ordinary release procedure, through pregnancy, or for other reasons; and others have gone abroad or to other Commands. Hence detailed information has been delayed and is not available for inclusion. The information available is given in table IV, which shows that known relapses after treatment totalled 11 out of 266 (4%).

SUMMARY

Methods of diagnosis and treatment are described of 266 women with gonorrhœa admitted to a military hospital from January, 1942, to June, 1945. Of these, 131 had gonorrhœa alone and 135 had trichomonas vaginitis in addition. Most of the patients were in their early twenties and unmarried.

Notification by infected partners is an effective method of bringing symptomless patients under treatment, and as carried out in the Services does not cause resentment. Most patients so notified were found to be infected; a few had no evidence of infection. If mistakes had been made in notifying these cases they were probably made in good faith.

A third of all these patients had no symptoms or symptoms so slight that they did not consider them abnormal. The proportion of symptomless cases among the women was greater with gonorrhœa alone than among those with complicating trichomonas vaginitis. The fact that gonorrhœa in the female is often symptomless is not always appreciated by doctors, and in consequence cases are missed.

Similarly, the absence of well-marked signs of infection should not be accepted as conclusive evidence that gonococcal infection is absent, especially when the infection is of some duration or treatment has been given.

Cultural tests are of paramount importance in the diagnosis of gonorrhœa in the female. The general experience is that with good technique cultures are a much more sensitive diagnostic method than smears. In the group of cases under consideration this was not so, largely because frequent changes of personnel lowered technical standards.

The major cause of ineffective cultural methods is faulty preparation of cultural media. Cultural testing in this country is unlikely to improve until good commercial culture media are widely used. In cases of difficulty smears and cultures may have to be repeated several times; one negative series of tests is never sufficient.

The immediate results obtained by treating these cases with various courses of sulphonamides and with penicillin are tabulated. The known results of follow-up and tests are given but are incomplete.

We wish to thank Brigadier T. E. Osmond for constant encouragement, and Colonel W. P. Croker, O.C. Royal Victoria Hospital, Netley, for permission to publish details of the cases.

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TREATMENT OF LUPUS VULGARIS WITH CALCIFEROL

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DURING August, 1943, two patients attending the outpatient department at St. Thomas's Hospital for lupus vulgaris were given for treatment calciferol (vitamin D_2) 150,000 I.U. daily in the form of three 'Ostelin High Potency' tablets, each of which contains 50,000 I.U. of calciferol.

Owing to the war one of the patients was lost sight of for a time, though she returned at rather long intervals for further treatment. She was given altogether four courses of calciferol 150,000 I.U. daily, each lasting two months; when seen recently, some six months after the last course, she appeared to be cured of lupus.

The other case has been fully described (Dowling and Thomas 1945, 1946). The patient attended regularly at short intervals, and within three months it became evident that he was making rapid strides towards recovery. He was greatly impressed by the progress he had made and was anxious that we should appreciate the fact that something remarkable had happened.

Had it not been for this first striking result, it is possible that we should not have applied the remedy to other cases until a much later date, until in fact we became aware that similar treatment had been carried out in France during the war years with very much the same results. However, as it was, every case of lupus under our care, whether at St. Thomas's Hospital or elsewhere, was henceforth treated with calciferol by mouth.

EXPERIENCE OF THE METHOD

Up to December, 1945, forty cases were so treated, of which the following are examples. They have already been reported (Dowling and Thomas 1946).

CASE 1.—A man, aged 28, the first of our cases to be treated with calciferol, attended in August, 1943, because of confluent lupus of face and ears. The face was swollen and congested, and the upper lip œdematous. For five years he had been treated regularly with carbon-arc-light baths and Finsen rays. The lupus had begun near the right ear when he was aged 20, and it had steadily spread, first over the ear, then to the nose and cheeks. For nine months before he came under observation the whole of the face had been œdematous.

He was now prescribed calciferol 50,000 I.U. by mouth three times a day. He said that after a few days he developed nausea, felt ill, and had to go to bed; the skin became worse, with increased congestion, and there was some exudation. He therefore discontinued the treatment and stayed in bed a fortnight, after which the congestion subsided and he noted that the lupus had so much improved that he began to take calciferol again.

After a month there was a second relapse, though less severe than the first. He again discontinued calciferol temporarily. From that time he has tolerated the drug well, except for slight occasional "stomach disorder." The lupus continued to improve, and the dose of calciferol was reduced to 50,000 I.U. twice daily.

By July, 1945, there were no signs of activity except two nodules locked in scar tissue in the right cheek. The dose was then further reduced to 50,000 I.U. daily until Oct. 30, when it was discontinued altogether. The serum-calcium level was then 14 mg. per 100 c.cm.

CASE 2.—A woman, aged 73, with superficially ulcerative and crusting lupus, which began ten years ago on the nose and gradually spread across the cheeks. She has been under the care of the skin department at St. Thomas's Hospital during the whole of the period. She was unable to tolerate general light treatment and until October, 1943, was treated chiefly by local measures. Though controlled to some extent, the gradual progress of the disease was not checked by these

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measures. In October, 1943, she was given calciferol, 50,000 I.U. twice daily without further local treatment, and continued on this dose until July, 1944, when she was evacuated to the country. From that time she had no further treatment. When she returned to London in October, 1945, the lupus had apparently disappeared altogether.

CASE 3.—A man, aged 51; was first seen in December, 1944, with extensive lupus of the upper and inner aspect of the right thigh. The disease had slowly progressed for some years, and the whole area was thickened, raised, dusky red, and slightly scaly, bearing some resemblance to lichen simplex chronicus. The diagnosis of lupus was confirmed by biopsy. From January, 1945, he was given calciferol 50,000 I.U. three times a day. After a month the lesion became flatter and paler; the dose was then reduced. The whole area soon became quite flat, superficially scarred, pigmented, and with no sign of lupus. He has had no other treatment of any kind at any time.

CASE 4.—A woman, aged 55, had originally had a relatively small lupus in the left cheek excised eight years ago at St. Thomas's Hospital. It recurred almost immediately and spread actively. The patient then left the hospital and was for some years treated with Finsen therapy without success. She returned to St. Thomas's Hospital in May, 1944. The lupus was then ulcerative, covered with a thick adherent crust, and much larger. On calciferol 100,000 I.U. daily, later increased to 150,000 I.U., the lupus became flatter and ulceration stopped; but, though the lupus has not spread there were still some nodules at the periphery of the lesion in January, 1946.

The most that can be said for this patient, who, though in flourishing general health, never showed the least sign of coming to terms with her lupus, is that, after taking calciferol for more than a year, she is considerably better than she was when she started it.

CASE 5.—A woman, aged 72, first seen in July, 1944, had had a raised plaque of lupus tumidus on the forehead and glabellar area for thirty years. There was also superficially ulcerative lupus of the lobe and helix of the left ear and adjacent skin. She had had no treatment of any kind for about twenty years. She was given calciferol 50,000 I.U. three times a day. By September, 1944, the glabellar lesion was flatter and the ear was improving. The dose was then reduced to 50,000 I.U. twice daily, and this she continued to take until August, 1945, when it was further reduced to a daily dose of 50,000 I.U. The glabellar lesion was then quite flat and, apart from a small active area near the base of the nose, showed only residual pigmentation. The lupus of the ear had ceased to ulcerate, and no active nodules could be seen. Under further observation, this small active area increased in activity, improving again when the dose of calciferol was raised from 50,000 to 100,000 I.U. daily.

Cases 4 and 5 illustrate a difficulty that is met with occasionally. This is well exemplified by case 6.

CASE 6 (case of Dr. H. J. Wallace).—A woman, aged 24, first seen on Nov. 15, 1945, had some seven weeks previously had a small pustule under the left eye. The sepsis had subsided, but the surrounding area of inflammation had spread. On examination there was an area of reddish-brown lupus tissue, about the size of a halfpenny. No history of tuberculosis in the past. No evidence of tuberculosis elsewhere. Radiography of chest normal. Mantoux reaction not done.

Nov. 11: treatment with calciferol 50,000 I.U. t.d.s. for a fortnight began and was followed by involution of the lesion.

Dec. 12: dosage reduced to 50,000 I.U. b.d.

Jan. 13, 1946: lesion spreading, and dosage increased to 150,000 I.U. a day for a fortnight.

Jan. 27: lesion again healing, and dosage reduced to 100,000 I.U. a day. Blood-calcium level 11·5 mg. per 100 c.cm. On calciferol 100,000 I.U. daily there was no appreciable change in the activity of the lesion.

Dosage was subsequently again increased to 150,000 I.U. a day, and the lesion began involuting again. The patient, however, felt and looked ill.

She has had no further calciferol since Feb. 23, and on March 7 the lesion was still involuting, though she still looked and felt ill. Blood-calcium level on Feb. 21 was 12·9 mg. per 100 c.cm.

On April 8 the blood calcium was 11·6 mg.; involution was continuing but the patient still did not feel fit. On April 25 the blood calcium was 9·6 mg., and she felt quite well again. The affected area showed no definite clinical evidence of activity but there was residual discoloration of skin. A biopsy done at this stage showed no evidence of active tuberculous tissue.

In our summary (Dowling and Thomas 1946) of 39 cases, 7 were discarded as difficult to assess, chiefly because the patients had been extensively scarred by X rays in the past. Of the remaining 32, 18 appeared to be cured; 9 had much improved but were not cured; and 5 had made only moderate progress.

The method of treatment has been the same throughout: calciferol by mouth, chiefly in the form of ostelin high potency tablets, but in a few cases as an emulsion made up as follows:

Mist. vitamin D conc. (50,000 I.U. per drachm)

Vitamin D (Glaxo) (10^6 units per g.)	160 g.
Acacia pulv.	1½ oz.
Mucilage tragacanth, or equivalent	4 fl. oz.
Propyl gallate (or hydroquinone)	gr. 20
'Nipagin' (or chloroform) to preserve	gr. 20
Water to	40 fl. oz.

This is diluted ten times for dispensing—i.e., it is supplied to the patient in a strength of 50,000 I.U. per drachm.

The few cases treated with this emulsion did very well. Some received, besides calciferol by mouth, local treatment, chiefly in the form of focal injections of 'Eulykol' and the application of liquid acid nitrate of mercury.

The dose was generally 150,000 I.U. daily, this being the highest dose that the average patient will tolerate without experiencing nausea. Most patients can take it comfortably, but occasionally it has been necessary to reduce it to 100,000 I.U. Experience has shown that the latter dose, though sometimes adequate, is not always so, and 50,000 I.U. daily for an adult appears to be of little use.

The cases observed up to December, 1945, did not include any in which accurate observations could be made on the effect of calciferol on lupus of mucosa. However, since then an old case of lupus of gums and tongue cleared rapidly under the treatment, and Mr. Douglas Harmer has permitted us to publish his notes of the following two cases.

CASE 7.—A woman, aged 37, suddenly developed a husky voice and pain after a cold in 1927. Examination showed a large area of red induration, with patches of ulceration, in the pharynx and small lesions on the soft palate. Later there was extensive disease in the larynx, involving both vocal cords and destroying the tip of the epiglottis; cervical glands enlarged.

She was treated for nineteen years with radiotherapy, general and local remedies, and light treatments, and spent eighteen months at Leysin. Lesions in mucosa improved slowly, but skin of face, nose, lips, neck, and arm became affected, and disease remained active in spite of all treatment.

In November, 1945, treatment with ostelin tablets was begun, and all lesions improved in a month and were arrested completely in three months.

CASE 8.—A woman, aged 60, first noted in 1932 a sore on her left tonsil, which became indurated and was thought at first to be a new growth. Biopsy showed it to be an endothelial tubercle. Within a year the whole pharynx, larynx, and glands became involved, and later the lip and tongue also.

The disease remained active for sixteen years in spite of all sorts of treatments. Tongue and lips became so ulcerated that patient had great difficulty in eating and was never free from pain. Sulphanilamides and penicillin produced only slight improvement.

In November, 1945, treatment with ostelin tablets was begun, and all the lesions of skin and mucosa healed within a month.

Thus is it established beyond doubt that calciferol, in near toxic dosage by mouth, will effect clinical cure in a substantial proportion of cases of lupus vulgaris (over half in our series) and improvement in all. This fact must explain the beneficial effect of heliotherapy and

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general carbon-arc-lamp baths, abundant milk and butter, cod-liver oil, and such remedies as the Gerson-Hermannsdorfer and Sauerbruch diets. It remains to be seen whether all cases of lupus can be cured by the new remedy, and whether there is any method of administration which will ensure success in all cases. This brings us to the French literature, which is of considerable scope and includes observations on the effect of massive doses of calciferol on almost every variety of tuberculosis. We are, however, concerned only with lupus.

RESULTS OF FRENCH WORKERS

Charpy (1943) reported the treatment of 27 cases of lupus with large doses of calciferol, together with calcium by mouth as calcium gluconate or 1–2 litres of milk daily. His method, which he began to apply in 1941, was to give 15 mg. of calciferol—i.e., 600,000 I.U.—in propylene glycol by mouth weekly for three months; the same dose fortnightly for the next three months; and then one dose of 15 mg. monthly during the winter months. Of these 27 cases 8 were cured by internal treatment alone and the remaining 19 required an occasional diathermo-coagulation. All were clinically cured, and in some the results had been maintained for eighteen months. No toxic symptoms were observed.

Later, Charpy (1944) described a more intensive method of treatment: calciferol 15 mg. three times a week for the first week; 15 mg. twice a week for the next three weeks; and then one dose a week for the next four months. Of 5 cases treated in this way 2 were cured within a month and 3 required one diathermo-coagulation.

Charpy (1944) found that in oily solution calciferol by mouth was not very effective, but he drew attention to an observation of two colleagues, who had treated 2 cases successfully by intramuscular injections of the oily solution, a method of which he had no personal experience.

The work of Vachon and Feroldi (1945) suggests that the results of treatment by the Charpy method and ours are very much alike. They carried out biopsies on 7 cases treated by this method. They observed in 5 cases a few persistent lupomas, which on microscopical examination showed the characteristic structure of lupus. In 2 cases clinical response was poor. They conclude that, though the treatment usually brings about a rapid amelioration of the tuberculous process in less than three months, complete cicatrisation taking from six months to a year, in certain cases the remedy is ineffective.

Histologically the results appeared to them less satisfactory than they were clinically. In all cases examined, persistent lupomas could be observed in the scar tissue. In cases that appeared to be cured clinically the lesions observed were those of a cicatricial tuberculosis: nodules limited and surrounded by dense connective tissue, with no trace of surrounding inflammatory reaction. In the cases in which no clinical amelioration was obtained, the histological picture was one of active lupus. They found no deposits of calcium in any of their sections, and concluded that the amelioration in no way depended on calcification; the treatment brought about a progressive strangulation of the tuberculous process by connective tissue.

Gougerot and Gaullier (1944) reported that in a series of 35 cases of lupus treated by the Charpy method, 20 were clinically cured, 5 were much improved, 6 not greatly improved, and 4 were unchanged.

So far, therefore, the question whether the refractory cases can be cured by varying the method of administration remains unanswered. We do not know how calciferol acts in lupus, nor why in some cases it is relatively ineffective. It is also impossible to say beforehand which cases are likely to respond rapidly or gradually, or to be refractory. It seems probable, however, that in a fairly large minority complete resolution under treatment with calciferol is not to be expected.

TOXIC EFFECTS

Apart from experimental work on animals, the literature contains many reports of the therapeutic trial, sometimes for prolonged periods, of large doses of calciferol in various diseases, and on its toxicity and its effect on calcium and phosphorus metabolism. The dosage used in arthritis, for instance, has generally been much higher than that used by us in lupus. Steck et al. (1937) studied the effects of massive doses on 64 dogs and 773 human subjects. The routine daily dose was from 200,000 I.U. daily upwards for periods ranging from seven days to five years. There were signs of toxicity in 8% of the patients. These investigators state that hypervitaminosis D first produces cell injury, which is followed by calcium deposition; but that the process is reversible and reparable if administration is discontinued promptly. Intoxication for short periods did not lead to any recognisable permanent injury. They conclude that human subjects and dogs can generally survive the administration of 20,000 I.U. per kg. of body-weight daily for indefinite periods without intoxication; but they emphasise that kidney dysfunction of any kind and arteriosclerosis are contra-indications to massive vitamin-D therapy.

Snyder et al. (1943), in the treatment of 200 cases of chronic arthritis, gave 100,000–500,000 I.U. of vitamin D daily, the average dose being 200,000–300,000 I.U. In over five years no deaths took place and no evidence of serious toxicity was observed. Radiography showed neither calcification of blood-vessels nor stone formation in the kidneys or in the gall-bladder.

Such dosage seems far too high to be safe (Bicknell and Prescott 1946). Danowski et al. (1945) have reported 2 cases of renal damage due to prolonged therapy with vitamin D for arthritis; in one of them extensive calcification of soft tissues was demonstrable. Freeman et al. (1946) reported 3 further cases of the same kind—one transient, the other two serious. Complete recovery had taken place however six months after cessation of treatment with calciferol. The reporters rightly emphasise that vitamin-D therapy demands careful supervision, and that the patient should never be permitted to continue treatment on his own initiative. Frequent determinations of the serum-calcium level and prompt reduction of dosage if hypercalcæmia develops are essential, together with examinations of the urine and blood-pressure if renal complications are to be avoided. It appears to be agreed by all authorities on this subject that calcium intake should be controlled during vitamin-D therapy.

Among the French cases one of deposition of calcium in finger joints has been reported by Bureau (1945). Regarding toxic effects in our patients, in the 38 lupus cases previously reported (Dowling and Thomas 1945) 8 patients complained of symptoms of intolerance. However, apart from one patient, who said he was severely upset on two occasions, the symptoms were relatively mild and transitory, consisting chiefly of nausea, loss of appetite, depression, or feeling out of sorts. Case 6 however looked and felt ill for some weeks after the treatment was stopped.

With adequate precautions, and assuming that the patient is under regular observation, it seems unlikely that the administration of calciferol for limited periods in the dosage used by us, which has never exceeded 150,000 I.U. daily, would entail any great risk of causing calcification or other serious sequelæ. There is little doubt, though, that there is considerable individual variation in the toxic threshold.

CALCIFEROL THERAPY AND SERUM-CALCIUM LEVELS

Reports show wide variation in the laboratory findings following massive doses with vitamin D (Klassen and Curtis 1943). The serum-calcium level has been found

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as high as 30 mg. per 100 c.cm. in some cases, whereas in others it has been raised only slightly. There appears to be no definite association between toxic symptoms and a high serum-calcium level. Serum-calcium estimations in 12 of our cases after various dosages and periods showed levels of 10·1–10·8 mg. per 100 c.cm. in 6 cases; about 11 mg. per 100 c.cm. in 3 cases; and hypercalcæmia (12·6, 13·8, and 14·8 mg. per 100 c.cm.) in 3 cases. Of the 3 cases with hypercalcæmia, the first patient had been taking 100,000 I.U. daily for three months and had merely complained of slight nausea once or twice; the second had had nausea only on 150,000 I.U. daily; and the last, though intolerant to 150,000 I.U. daily, also took a lower dosage without symptoms of any kind. Another patient, who had a serum-calcium level of 13·5 mg. per 100 c.cm. after taking 100,000 I.U. daily for three months, was perfectly well and had no symptoms.

When hypercalcæmia has arisen, the serum-calcium level may not become normal for some months after the drug has been stopped. In the last-mentioned case, for example, the serum-calcium level on Nov. 13, 1945, was 13·5 mg. per 100 c.cm. She continued to take 100,000 I.U. daily until Dec. 11, when it was stopped; seven weeks later the reading was 14·6 mg. per 100 c.cm., falling a month later to 11·2 mg. per 100 c.cm. In the event of hypercalcæmia, therefore, it may be advisable to withhold calciferol for as long as three months. On the other hand, in another case the serum-calcium reading fell from 12·2 mg. to 9·7 mg. per 100 c.cm. in a month.

From the cases already quoted and from a considerable number of other serum-calcium estimations made during treatment it appears that clinical improvement does not correspond to a rise in serum-calcium level. In fact, some of the patients with hypercalcæmia did not do particularly well, whereas others in whom no important rise in the serum-calcium level took place responded well to the treatment.

From these rather fragmentary observations on serum-calcium levels during treatment with calciferol, carried out during the course of routine work in a busy out-patient department, it appears that it is advisable to have these levels estimated at regular intervals during treatment—e.g., at intervals of about two months. If hypercalcæmia develops the drug should be stopped until the reading has become normal.

Our experience has shown that the moderately large dose of 150,000 I.U. daily is usually more effective than 100,000 I.U. daily, though the latter may be adequate; that an ineffective dose remains ineffective, however long it be continued; that a number of rather short rather intensive courses, as in the case mentioned in the first paragraph of this article, with substantial intervals between them, may end as successfully as a single prolonged course; and that, when the tuberculous process has become inactive, it is useless to try to get rid of persistent lupomas locked in scar tissue by further treatment with calciferol.

SUMMARY AND CONCLUSIONS

Calciferol (vitamin D_2) in high dosage is a remedy of great value in the treatment of lupus vulgaris. It was used first in France by M. J. Charpy, who began to treat lupus in 1941 with calciferol in propylene glycol ('Sterogyl,' Roussel) by mouth. We began independently to treat lupus in a similar way in 1943, using chiefly 'Ostelin High Potency' tablets (Glaxo). Our results appear to have been similar to those observed in France. Rather more than half of the cases appear to have been cured by the remedy, others greatly improved, while about a fifth have been relatively unresponsive.

Both toxic symptoms and hypercalcæmia have occurred with some frequency in our cases. The symptoms have usually been mild and transient, disappearing immediately when the treatment has been stopped or the dose lowered; occasionally however the patients have felt ill for some weeks after cessation of the treatment. In cases of hypercalcæmia the serum level has returned to normal in 1–3 months.

The effect of the drug on the disease does not seem to be related either to symptoms of toxicity or to the serum-calcium level.

When hypercalcæmia is noted it is advisable to stop treatment until the reading has become normal.

We wish to thank Dr. W. J. Griffiths of the department of chemical pathology at St. Thomas's Hospital for his valuable coöperation and help.

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ORAL ADMINISTRATION OF PENICILLIN TO INFANTS

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THIS paper embodies the results of an investigation designed to show the degree and rate of absorption of penicillin from the alimentary tract in young infants. The frequency and seriousness of staphylococcal infections in this age-group often indicate penicillin therapy, but difficulties in administration have prevented its routine use. At present it is usually given intramuscularly at three-hourly intervals, a procedure which involves repeated trauma; this is an important matter in young infants, especially when premature, owing to the difficulty of finding an adequate volume of muscle for repeated intramuscular injections. Therefore, if found reliable, the administration of penicillin by mouth would be of special advantage in infancy.

In 1941 Abraham and his colleagues reported the successful treatment of a *Staph. aureus* urinary infection in an infant by oral administration of penicillin, high urinary bacteriostatic levels being maintained for seven days. Since this observation investigations on oral administration of penicillin have been confined to the adult and have shown that there are such wide individual variations in the absorption-rate from the alimentary tract that with present methods oral administration cannot be relied on for the treatment of severe pyogenic infections.

For administration by mouth to be effective, the factors which have to be overcome are (1) the destruction of penicillin by the acid of the gastric juice, (2) variable intestinal absorption, and (3) inactivation in the bowel by organisms producing penicillinase. Attention has been directed mainly to methods for preventing the destruction of penicillin by the gastric juice—e.g., by the administration of various antacids, by the incorporation of penicillin in various oils, and by enclosing it in capsules. In these circumstances Cutting et al. (1945) have found that absorption by normal and by achlorhydric patients is approximately the same. However, after oral administration to 10 achlorhydric patients, they demonstrated adequate blood-penicillin levels in only 7 cases. This suggests that in the adult, gastric acidity is not the

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only cause of unreliable oral administration. The relation of the time of administration to meals may be of importance. Finland et al. (1945) reported more uniform absorption when penicillin was given shortly before meals; they found that a dose of 90,000 units given by mouth half an hour before breakfast produced blood-penicillin levels comparable with those obtained when 15,000 or 20,000 units was given intramuscularly.

PROCEDURE

Forty-three test doses of penicillin were given to 37 infants, and from one to eight samples of blood were taken after each dose for estimation of the bacteriostatic level in the serum. Thirty-two observations were made on 28 infants aged less than a month; five of these observations were on 4 premature infants with a birth-weight of less than 5 lb. Eleven observations were made on 9 infants aged 1–12 months. The infants were all healthy except 3 newborn infants who had infections.

The sodium salt of penicillin was used. The dose of penicillin varied from 5000 to 100,000 units dissolved in 2–3 c.cm. of normal saline solution. It was added to the first ounce of a milk feed, and the remainder of the feed was given immediately afterwards; in breast-fed infants the ounce of milk was expressed from the mother's breasts. The mixture was invariably taken well when 10,000 or 5000 units was given, but hesitation was sometimes shown with 100,000 units; this difficulty was easily overcome by adding the penicillin to a larger volume of milk and introducing a teaspoonful of sucrose to make the mixture more palatable.

The penicillin content of the serum was estimated by a serial dilution method (McAdam et al. 1945); the results are expressed as the highest dilution of the serum in nutrient broth found to be completely bacteriostatic to the standard *Staph. aureus*. Under the conditions of the tests the lowest bacteriostatic concentration was about 0·04 unit per ml.

RESULTS OF ORAL ADMINISTRATION

From Birth to One Month.—This group was the one most thoroughly studied. The results are shown in table I. Penicillin 100,000 units was given in a milk feed, as described, on seven occasions (6 infants, nos. 1–6), and high serum bacteriostatic levels were obtained in each case. High levels (from 1 in 16 to 1 in 64, or approximately from 0·6 to 2·5 units per ml.) were maintained from half an hour to four hours after administration; adequate amounts were present in all 4 cases examined at twelve hours, and in 2 out of 4 cases examined at fifteen hours.

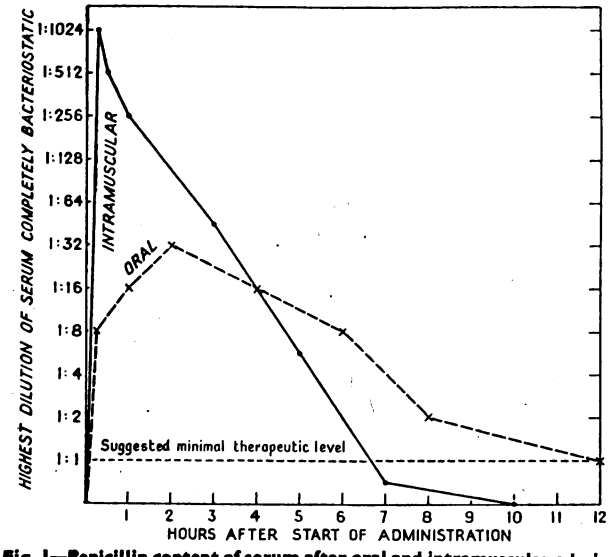

Fig. 1—Penicillin content of serum after oral and intramuscular administration of 100,000 units (case 6, aged 27 days).

Penicillin 10,000 units was given on nineteen occasions (18 infants, nos. 7–24). Levels of undiluted or higher were demonstrated from half an hour to six hours after administration in all samples tested; in the healthy infants readings of 1 in 4 were very common, and a level of 1 in 8 was reached in a few instances.

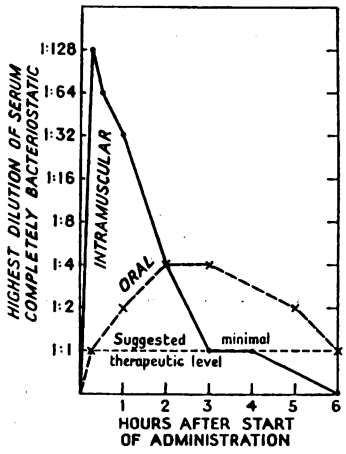

Fig. 2—Penicillin content of serum after oral and intramuscular administration of 10,000 units (case 10, aged 7 days).

Penicillin 5000 units was given on six occasions (5 infants, nos. 17*c*, 25–28), five of these observations being on 4 premature infants (nos. 25–28) weighing less than 5 lb. at birth, and one on a mature infant (no. 17*c*). Good levels were obtained in the premature infants with this small dose; from half an hour to three hours after administration the range was from undiluted to 1 in 8. Samples were not taken from these delicate babies after an interval of three hours.

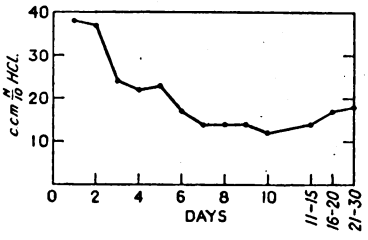

Fig. 3—Total acidity of fasting juice during first month of life, expressed in c.cm. of $\frac{N}{10}$ HCl per 100 c.cm. of stomach contents. (Modified from Miller 1941.)

From One to Twelve Months.—The results of oral administration in infants over a month old are shown in table II. An adequate bacteriostatic level was demonstrated in the serum of every patient, although the levels were lower and were not maintained for so long as in infants under a month old (table I). In the 5 patients (observations A–E*a*) who received 100,000 units of penicillin adequate bacteriostasis was maintained for only six hours, compared with twelve to fifteen hours in the newborn (first month) infants (table I). The number of infants in the older age-group is too small to enable any conclusions to be drawn regarding adequate dosage at various ages after the first month.

Comparison of Oral and Intramuscular Administration.—In 2 patients (nos. 6 and 10, table I) given 100,000 and 10,000 units by mouth estimations were made after intramuscular administration of the same doses. After intramuscular administration the highest bacteriostatic levels were found within the first half-hour, whereas after oral administration, apparently because absorption from the alimentary tract was slower, the maximum occurred between the second and fourth hours; although the maximum levels were lower after oral administration, adequate serum bacteriostasis was maintained for some hours longer than after intramuscular administration (figs. 1 and 2).

Treatment by Mouth of Three Infants with Infections.—During the short period of the investigation we treated by the oral route 2 infants with a *Staph. aureus* infection and a third with extensive infected burns.

No. 17 (table I) was a mature infant, aged two weeks, admitted to hospital in a grave condition with Ludwig's angina. The severe pressure effects—aphagia, cyanosis, and œdema of the head—were relieved by drainage of a large

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deep cervical abscess through a midline incision. *Staph. aureus* was isolated in pure culture. The aphagia necessitated intramuscular administration of penicillin for two days, after which 10,000 units was given by mouth three-hourly (17*a*, 17*b*). After several days of grave illness the infant progressed steadily and the wound healed rapidly. When recovery was well advanced, the dose was reduced to 5000 units by mouth three-hourly and an adequate bacteriostatic level was maintained (17*c*).

No. 26 (table I) was a premature infant, aged 23 days, who developed a small abscess 0·75 cm. in diameter in the left groin. *Staph. aureus* was isolated in pure culture from aspirated pus. Treatment with 5000 units of penicillin three-hourly by mouth was given, and the lesion had much regressed four days later without rupturing. High bacteriostatic levels were obtained on the second and fourth days of treatment (26*a*, 26*b*).

No. 13 (table I) was a mature infant, aged 12 days, admitted to hospital with extensive infected burns of the scalp and right leg. Unfortunately cultures were not taken. Penicillin 10,000 units given by mouth three-hourly produced high bacteriostatic levels. The infant's condition deteriorated for a time, but recovery ultimately resulted.

Conclusions cannot be drawn from so few cases; but, regardless of the results of treatment, which appeared to be beneficial in the first 2 cases, the relatively high bacteriostatic levels obtained in all 3 cases suggest that even better levels may be obtained in ill infants than in healthy ones.

DISCUSSION

It has been found that, in the infant under a month old, administration by mouth is a simple and thoroughly reliable method of giving penicillin. Therefore it may be assumed that the factors which make oral administration unreliable in the adult are not present at this early age. Miller (1941) has investigated the gastric acidity of infants under one month and has shown that there is a steady sharp decline of acidity in the fasting juice until the tenth day of life, after which there is a very slow rise throughout the remaining days of the first month (fig. 3).

The observations of Cutting et al. (1945) on oral administration in the adult suggest that inactivation of penicillin by gastric acid is only one of the factors making this method unreliable. It may be that in the infant more rapid absorption from a relatively sterile jejunum partly explains the greater effectiveness of oral administration. Although the total amount of penicillin excreted in the urine of these infants has not been estimated, from a comparison of the serum-penicillin levels after oral and intramuscular administration (figs. 1 and 2) it appears that inactivation either by gastric acid or by penicillinase-producing organisms is not considerable; thus absorption from the jejunum takes place slowly over several hours. The rapid excretion following intramuscular administration eliminates the possibility that the maintenance of high blood-penicillin levels after oral administration is attributable to poor renal function.

Figs. 1 and 2 illustrate a further important difference between the efficiency of oral administration in the adult and that in the infant. Finland et al. (1945) have found that, to obtain bacteriostatic levels of comparable duration in the serum of adults, it is necessary to administer orally five times the intramuscular dose. In the infant the position is reversed: 10,000 or 100,000 units given by mouth produce adequate serum bacteriostatic levels for a longer period than the same doses given intramuscularly.

The investigation of the older age-group (1–12 months) is too incomplete to warrant a definite conclusion, but it indicates that there is moderately uniform absorption of penicillin from the alimentary canal and suggests that, provided sufficiently large doses—e.g., 100,000 units six-hourly—are used, oral administration should be an effective method of giving penicillin to infants of this age.

TABLE I—PENICILLIN CONTENT OF SERUM AFTER ORAL ADMINISTRATION IN INFANTS UNDER A MONTH OLD, EXPRESSED AS THE HIGHEST DILUTION OF SERUM IN NUTRIENT BROTH WHICH WAS * COMPLETELY BACTERIOSTATIC TO THE STANDARD *Staph. aureus*

No. of infant	Age (days)	Dose (units)	Before penicillin	Hours after administration										
				½	¼	1	2	3	4	5	6	8–9	12	15
1	4	100,000	0	..	32	64	64	64	32	..	..	..	..	..
2	9	100,000	0	..	..	..	32	..	..	..	8	1	1	½
3	10	100,000	0	..	..	..	16	..	..	..	8	2	1	1
4	12	100,000	0	..	..	..	16	..	..	..	8	2	1	1
5*a*	20	100,000	0	..	16	32	64	64	32	..	..	..	..	..
5*b*	27	100,000	0	4	..	..	16	..	8	..	4	..	..	..
6	27	100,000	0	8	..	16	32	..	16	..	8	2	1	0
7	4	10,000	0	..	8	8	8	..	4	2	..	..	..	..
8	4	10,000	..	..	..	..	..	4	..	..	..	..	..	..
9	7	10,000	..	..	..	..	..	4	..	..	..	..	..	..
10	7	10,000	0	1	..	2	4	4	..	2	1	..	..	..
11	9	10,000	..	..	..	..	..	2	..	..	..	..	..	..
12	10	10,000	..	..	..	..	..	4	..	..	..	..	..	..
13	12	10,000	..	..	32	16	..	8	..	..	..	..	..	..
14	14	10,000	..	..	..	..	..	2	..	..	..	..	..	..
15	14	10,000	..	..	..	4	..	4	..	..	..	..	..	..
16	14	10,000	0	..	..	..	2	2	2	2	1	..	..	..
17*a*	14	10,000	..	..	..	16	..	32	..	..	..	..	..	..
18	15	10,000	0	..	¼	1	1	2	..	2	1	..	..	..
19	15	10,000	0	..	..	..	1	2	2	2	1	..	..	..
20	15	10,000	..	..	..	..	..	2	..	..	..	..	..	..
17*b*	17	10,000	..	..	..	4	..	4	..	..	..	..	..	..
21	19	10,000	0	..	2	2	2	..	1	1	..	..	..	..
22	22	10,000	..	..	..	..	..	2	..	..	..	..	..	..
23	27	10,000	0	..	..	..	4	4	2	1	1	..	..	..
24	28	10,000	..	..	..	..	..	2	..	..	..	..	..	..
25*	3	5000	0	..	8	..	..	4	..	..	..	..	..	..
17*c*	21	5000	..	..	..	2	..	2	..	..	..	..	..	..
26*a**	23	5000	..	..	..	32	..	8	..	..	..	..	..	..
26*b**	25	5000	..	..	..	..	..	8	..	..	..	..	..	..
27*	28	5000	0	..	1	2	..	4	..	..	..	..	..	..
28*	28	5000	0	..	2	4	..	8	..	..	..	..	..	..

0 = no stasis in undiluted serum.
½ = partial stasis in undiluted serum.
1 = complete stasis in undiluted serum (0·04 unit penicillin per c.cm.).
2 = complete stasis in serum diluted 1 : 2.
4 = complete stasis in serum diluted 1 : 4; and so on.
a = first observation, *b* = second observation, and *c* = third observation on the same infant.
* = premature infant.

TABLE II—PENICILLIN CONTENT OF SERUM AFTER ORAL ADMINISTRATION IN INFANTS AGED 1–12 MONTHS

Observation	Age (days)	Dose (units)	Before penicillin	Hours after administration										
				½	1	2	3	4	5	6	8	10	12	15
A	60	100,000	0	4	..	4	..	8	..	1	..	..	0	0
B	120	100,000	0	16	32	16	4	1	..	1	0	..	0	..
C	180	100,000	0	4	..	2	..	..	..	1	..	0	..	..
D	315	100,000	0	16	..	16	..	..	..	1	..	..	..	..
E*a*	360	100,000	0	1	..	4	..	..	..	1	..	½	..	..
E*b*	365	30,000	0	1	1	1	½	0	..	..	..	..	..	..
E*c*	370	30,000	0	..	0	..	1	..	..	..	..	..	..	..
F	240	20,000	..	..	2	..	1	..	..	..	..	..	..	..
G	33	10,000	..	..	..	..	8	..	..	..	..	..	..	..
H	34	10,000	..	..	..	..	4	..	..	..	..	..	..	..
I	44	10,000	..	..	..	..	1	..	..	..	..	..	..	..

Footnotes as in table I.

Figs. 1 and 2 illustrate a further important difference between the efficiency of oral administration in the adult and that in the infant. Finland et al. (1945) have found that, to obtain bacteriostatic levels of comparable duration in the serum of adults, it is necessary to administer orally five times the intramuscular dose. In the infant the position is reversed: 10,000 or 100,000 units given by mouth produce adequate serum bacteriostatic levels for a longer period than the same doses given intramuscularly.

The investigation of the older age-group (1–12 months) is too incomplete to warrant a definite conclusion, but it indicates that there is moderately uniform absorption of penicillin from the alimentary canal and suggests that, provided sufficiently large doses—e.g., 100,000 units six-hourly—are used, oral administration should be an effective method of giving penicillin to infants of this age.

SUMMARY

The penicillin content of the serum, after administration by mouth, has been estimated in 37 infants, 28 of whom were less than a month old, and 9 were aged from one to twelve months. All the infants were healthy except 3 in the neonatal group.

In infants under a month old, adequate serum bacteriostasis was obtained for as long as fifteen hours after 100,000 units of penicillin given by mouth, and for six hours after 10,000 units; 5000 units was an adequate oral dose for premature infants.

In infants aged from a month to a year the administration of 100,000 units produced adequate serum bacteriostasis for six hours.

Penicillin was given by mouth at regular intervals to 3 infants in the neonatal group with infections. They

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showed a higher degree of serum bacteriostasis than did the healthy infants in this group.

We wish to thank Prof. T. J. Mackie, of the department of bacteriology, for facilities in his laboratory, and Mr. R. Farmer, who carried out the bacteriostatic estimations. We are also indebted to Prof. J. R. Learmonth and to Dr. J. P. Duguid for help in preparing this paper.

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Medical Societies

NUTRITION SOCIETY

A MEETING of the Scottish group was held in Edinburgh on May 25, with Prof. D. MURRAY LYON in the chair, to discuss

Hospital Dietetics

Miss RUTH PYBUS (late sister dietitian at the Royal Infirmary, Edinburgh) read a paper on the Development of Hospital Dietetic Departments. Miss Pybus referred to the slowness of development in this country compared with America and Canada, and to the need for improvement in hospital food. "In view of the appalling food situation in other European countries and in Asia, it would seem incongruous to use such terms as monotonous or deficient in connexion with the well-laden trays served three or four times a day to patients in British hospitals. There is of course no question of clamouring to the Government for more food for patients or staff, but it is essential that all hospital inmates should receive their full share of such foods as are procurable, and that the buying, cooking, and serving of hospital food should be in the hands of trained men and women as soon as those are available." Miss Pybus admitted the difficulty of reorganising the hospital food service at present, in view of the shortage of trained food supervisors and the limited supply of food and equipment. She foresaw great improvements within the next five to ten years, if more dietitians could be trained on the right lines, and if the importance of diet in prevention and cure was more generally appreciated by the medical profession and by the administrative hospital staffs.

Prof. E. W. H. CRUICKSHANK (Aberdeen) read a paper on a dietary survey which had been carried out in maternity wards of fifteen Scottish hospitals between February and August, 1945. An extra diet was ordered each day, and at every meal a sample serving of each dish was chosen and the nutrients calculated. General and plate wastage were observed, and carbohydrate, protein, and fat in each day's diet were calculated. Vitamin C was estimated in each sample. Extras brought in by patients' friends were also examined.

A target, or standard of comparison, was made by calculating the nutrients in an acceptable diet the cost and attainment of which were within the reach of every hospital. This target diet contained 2546 calories, derived from 99 g. protein (including 60 g. animal protein), 108 g. fat, and 298 g. carbohydrate. It also included 1·7 g. calcium, 13 mg. iron, 3429 I.U. vitamin A, 1·3 mg. vitamin B_1, 2·4 mg. vitamin B_2, and 36 mg. vitamin C.

The general average of all hospitals showed a slight deficiency in calories, and a marked deficiency in animal protein, in fat, and, as might be expected, in vitamin A. Deficiencies in animal protein, fat, and vitamins A and C, which amounted to about 30%, were regarded as indicating the effect of war-time rationing on the diets of those who had to depend for their food upon large-scale catering. The magnitude of the deficiency in animal protein and fat could not be entirely explained by existing war-time difficulties of supply; in some of the hospitals they were partly attributable to inefficient catering.

The part played by patients' relatives and friends in augmenting diets was confined to fat and carbohydrate, the amounts being 16 to 18% of the respective totals. The consumption of liquid milk varied from 1 to $1^1/_2$ pints, which reflected a fairly good use of priority and non-priority supplies.

For the improvement of maternity diets emphasis was placed on milk, of which a nursing mother should receive 2 pints, and on liver, of which it was suggested nursing mothers should receive a priority supply. The importance of a better presentation of potatoes and green vegetables was stressed; the survey showed that both should be used more extensively. Amongst other points was the value of cocoa and milk as sources of iron. If patients' friends wished to give food, they should be encouraged to bring fruits; but it was wrong for the hospital to rely on such gifts. All hospitals should supply an adequate diet, which should in this country meet the requirements laid down in the target.

Dr. ALEXANDER LYALL (Aberdeen) showed that about 40% of patients in hospital require special diets. These include diets for febrile states, after abdominal operations, for diabetes, peptic ulcer, nephritis, steatorrhœa, osteoporosis, anorexia, and Addison's disease. The proper diets have to be converted to suitable meals; and mineral or vitamin deficiencies in the diet must be artificially replaced. The difficulties are those of obtaining the right foods, of enlisting the patient's coöperation, and of assimilation, which may be impeded by the illness. Many patients require dietetic care after discharge from hospital. The availability of food and proper facilities are difficult problems in these circumstances and under present conditions. Food like vegetables, fruits, and proteins are scarce and expensive. Although the Ministry of Food makes special arrangements for invalid diets, there are illnesses where no such provision is made.

MANCHESTER MEDICAL SOCIETY

AT a meeting of the society on April 3, Surgeon Rear-Admiral CECIL P. G. WAKELEY delivered an address on

Specialisation

in which he emphasised that specialisation is required in medicine today more than ever. It was important that with the advent of the National Health Service sufficient specialists should be available to cover the whole of England and Wales. A very sound basis of practical medicine and surgery should be obtained before specialisation is allowed, if medicine is not to be so divided into special departments, all divorced from each other, as to retard progress. The medical student should have a much more practical background before he attempts to specialise; there should be a swing back to a better general education, including the classics, history, logic, and statistics. The teaching of chemistry and physics should not be confined to the first year of study, but should be taught throughout the curriculum. The student has forgotten these subjects long before he starts his clinical studies, when he is faced with such problems as the physics of X rays and radium; and the chemistry of food and vitamins will become increasingly important. Anatomy and physiology should be taught in the final years of study and should not be limited to a preclinical period as at present. It is essential that before adopting a specialty the doctor should have a good basic training in the natural sciences, and should have practised in general medicine or surgery.

Mr. N. A. J. YOUNG suggested the value of the young doctor serving an apprenticeship with general practitioners; he deprecated the employment of part-time or amateur examiners, and suggested that there should be full-time "professional" examiners for the qualifying examinations. Mr. P. G. MCEVEDY considered that all medical students should spend six months in general practice to gain practical experience, and that would-be surgeons should learn under proper supervision and not be allowed unlimited freedom to operate in their early years. Dr. J. M. GREENWOOD mentioned the case of the potential consultant, who often went into general practice because of the difficulty of making a living while undergoing training.

Admiral WAKELEY, in replying, did not think professional examiners would be as good as those in constant contact with their ordinary work. He thought that no-one should begin to specialise without five years' preliminary training after qualification. All members

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of the honorary staff of hospitals should have beds in their own right, and it should not be possible for senior consultants to remain assistant honoraries, as had often happened in the past.

At the annual meeting on May 1, Prof. D. DOUGAL was elected president, and Dr. J. B. M. COPPOCK gave an account of the development of Penicillin.

Reviews of Books

Le cancer de la prostate et l'hypertrophie des glandes paraprostatiques

PAUL NIEHANS, surgeon and urologist to the hospitals of Vevey and Montreux. Berne: Tockanz & Flück. Pp. 28.

THIS book is designed to call attention to the view that benign enlargement and cancer of the prostate are both manifestations of sexual senility, and ought therefore to be treated by endocrinological methods. Dr. Niehans advocates the operation which sometimes—though, as he says, incorrectly—passes under his name, and consists in ligating on both sides of the body the ductuli efferentes between the testicle and epididymis. The result of this operation is said to be a greater effectiveness of male hormone, either through its increased production or conservation. Beginning with an anatomical, physiological, and endocrinological discussion, he proceeds to a general account of prostatic cancer and benign enlargement of the prostate. These two diseases, he maintains, only occur in consequence of the hormonal changes of advancing age, whereby the male hormone diminishes while the female hormone remains constant. Chronic irritation, he thinks, is a secondary factor which favours cancer, and, though it will not of itself produce the disease, it may determine its localisation. Niehans says that since 1927 he has tried to prevent malignant growths in more than a thousand men and women by fortifying their sexual effectiveness. This he has done in men by ligating the efferent tubules of the testis or by transplanting testes from other individuals, and in women by transplanting ovaries. "Les résultats furent étonnamment favorable. Les malades ne furent pas atteints de cancer."

He tends throughout to simplify a very complex problem, and many would disagree with his endocrinology. Nevertheless, some of his statements are stimulating. For example, he thinks the prostate in man is formed of two distinct parts: the prostate proper, derived from the wolffian canals, a male organ which late in life is apt to become the site of cancer; and the paraprostate, a conglomeration of male and female elements mainly arising from the müllerian system and forming that part of the gland concerned with senile prostatic hypertrophy. If, as commonly happens in advanced age, the hormonal balance is disturbed by a reduction of male hormone the prostate proper becomes atrophic and disposed to cancer, while the paraprostate becomes hypertrophic. Dr. Niehans lays down the three following rules: (1) Cancer can develop only when the secretion of sexual hormone has so diminished that the growth hormones of the pituitary have an increased influence. (2) Benign enlargement of the prostate arises only when the output of male hormone is no longer sufficient to control the female hormone. (3) Both cancer and prostatic hypertrophy can be avoided or counteracted by restoring the hormonal balance.

The addition of a reference list would be of value: though Dr. Niehans refers freely to published work, he does not indicate where the quoted papers are to be found.

Positioning in Radiography

(4th ed.) K. C. CLARK, M.B.E., radiographer in charge, Ilford Ltd. London: Wm. Heinemann. Pp. 526. 75*s*.

FEW of those interested in radiology now lack a copy of this well-known atlas. No major alterations have been made, but—a sign of the times—cineradiography now receives only one page while foreign-body localisation and mass radiography leap into prominence. On every page Miss Clark demonstrates how first-class films can be produced. Each section details the four factors of time, mA. sec., kV, and distance. The average radiographer, given enough time, should be able to reproduce Miss Clark's results, but in most of our departments, overworked and understaffed, the time is seldom adequate. If any additional factor could be standardised it would materially help. It would have been useful if Miss Clark had standardised the factor of distance for a greater number of organs, because the distortion effect of distance is not so important if modern fine-focus tubes are in use. There is a good supplement detailing all the factors for mobile and portable units, and in the next edition one hopes to see another supplement on darkroom procedure: more films are spoiled in the darkroom than in the radiographic rooms.

Venereal Diseases

Handbook of Diagnosis and Treatment. (2nd ed.) A. E. W. MCLACHLAN, M.B. Edin., D.P.H., F.R.S.E., consultant in venereal diseases for Bristol; lecturer in venereal diseases in the University of Bristol. Edinburgh: E. & S. Livingstone. Pp. 371. 15*s*.

IN this second edition, appearing only a year after the first, the matter is largely unchanged, but an account is given of the more rapid methods of treatment of syphilis with arsenoxide and bismuth; most, if not all, of these can only be used on patients in hospital. Dr. McLachlan has not yet had the opportunity of treating many cases of syphilis or gonorrhœa with penicillin, and is rightly cautious in his evaluation of this therapeutic substance. Most venereologists, however, will not agree that the patient need be in hospital for 24 hours for penicillin treatment of gonorrhœa, since equally good results have been obtained by many workers with schemes of treatment lasting but 8–10 hours. The civilian patient generally prefers not to come into hospital, and, since beds are scarce, the outpatient possibilities of penicillin in the treatment of gonorrhœa should be fully explored.

The Problems of Family Life

AGATHA H. BOWLEY, PH.D. Edinburgh: E. & S. Livingstone. Pp. 99. 5*s*.

FOR its modest size and price this little book could hardly be better. It fills a gap in the library of child psychiatry, since it emphasises especially those problems which are associated with the family situation as a whole. Dr. Bowley distinguishes clearly between the problems imposed on the child by mismanagement and the deeper problems arising from conflict within the child which are not "all due to the parents" as is so often remarked by sceptics. The simplification is not done at the cost of either accuracy or clarity and the whole book is illuminated by a gentle and persuasive appreciation of the real interests and needs of all children.

Since this is a book for parents and teachers rather than for the expert in child psychiatry (although the expert will find much in it to stimulate thought), it would perhaps have been worth while to give a very rudimentary explanation of the meaning of I.Q., encopresis, and a few other technical terms. Presumably requirements of space and economy dictated the arrangement of the three case-study analyses which summed up results; they are so important that an additional page to each would be space well used.

The Attendant's Guide

EDITH M. STERN. In collaboration with MARY E. CORCORAN, R.N., psychiatric nursing adviser, United States Public Health Service. London: Oxford University Press. Pp. 104. 3*s*. 6*d*.

IN England, the equivalent to an "attendant"—the person for whom this book is written—is the student mental nurse; and this guide is an excellent introduction to her work in mental hospitals. Her relationship to patients, doctors, and supervisors is put on a rational basis; courtesy towards patients and others is shown not as a high moral duty but as the common-sense approach to which all respond most readily. Chapters headed, for example, "Patients who do too much" and "Patients not fit to be seen," will help in the management of people who behave awkwardly. Details make interesting comparison with practice in our own country. Here there has been an unfortunate inclination to look on the work as casual and transitory, and books published for mental nurses are inadequate, describing diagnostic symptoms rather than types of behaviour. In some hospitals definite training courses have been set up but their effectiveness is impaired by the rapid turnover of employees. This book is therefore timely.

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THE LANCET
LONDON: SATURDAY, JUNE 22, 1946

Hæmopoietic Substances of Known Constitution

THE value of synthetic folic acid in anæmia and diarrhœa [1] is being confirmed. SPIES [2] has briefly described its effect in pernicious anæmia, nutritional macrocytic anæmia, sprue, and some miscellaneous cases. The criteria of diagnosis were carefully chosen—cases of pernicious anæmia all had achlorhydria, macrocytic anæmia, and megaloblastic marrow; cases labelled nutritional macrocytic anæmia had free HCl in the gastric juice but were otherwise similar to the pernicious cases; cases of sprue had excess fat in the stools as well. Doses of 100–200 mg. by mouth or 20 mg. intravenously were given (SPIES now thinks these doses too high, about 20 mg. by mouth daily being adequate). There was a reticulocyte peak about the fifth to eighth day, followed by a sustained rise in red cells and hæmoglobin, and the general condition was improved. Good responses were also obtained in one case of anæmia associated with alcoholic cirrhosis of the liver and in one patient with carcinoma of the stomach. Cases of aplastic anæmia, iron-deficiency anæmia, and leukæmia showed no response. DARBY and colleagues,[3] who give a detailed account of 3 patients with sprue treated with folic acid only, in a dosage of 15 mg. intramuscularly daily for three weeks, report, for the first time, a definite transformation of a predominantly megaloblastic marrow to a normoblastic picture. Glossitis and diarrhœa abated, though the fat content of the stools remained high; the flat glucose-tolerance curves returned towards normal, and the patients put on weight. These changes have persisted for two months. One patient had previously received other vitamin-B factors—nicotinic acid, riboflavine, pantothenic acid, and pyridoxine—for five weeks without effect. ZUELZER and OGDEN [4] report on a group of severe anæmias in infants from birth to sixteen months in which the marrow was megaloblastic, and their coloured illustrations leave no doubt on this point. They gave liver extract intramuscularly to some of the patients and folic acid (intramuscular and by mouth) to others. The results were comparable; there was a definite reticulocyte response, a sustained rise in red-cell count and hæmoglobin, and transformation of megaloblastic to normoblastic marrow. Once folic acid had been given no further response could be obtained with liver, and vice versa. This curious group of anæmias is apparently limited to infants about the first year of life, and is attributed to a transient deficiency of the anti-anæmic factor. In India CARRUTHERS [5] gave folic acid to 6 patients with chronic diarrhœa and an iron-deficiency type of anæmia; the treatment rapidly checked the diarrhœa but had no effect on the anæmia.

Some animal experiments on folic-acid deficiency have been done by ENDICOTT and colleagues.[6] They fed rats on the usual purified diet to which all vitamin-B factors except folic acid had been added, together with succinyl sulphathiazole to prevent synthesis in the bowel. The bone-marrow of these animals became hypocellular, the granular leucocytes being most affected, and the erythropoietic tissues were also depleted. The rats developed a severe leucopenia, but only some showed anæmia, and then it was of normocytic type. Crystalline folic acid caused a rapid regeneration of the marrow with a well-marked proliferation of the granular leucocytes, and in the anæmic rats there was also a temporary hyperplasia of the erythropoietic tissues. These findings, though they bear little relation to the human conditions benefited by folic acid, confirm its connexion with blood-cell formation, and are likely to stimulate further studies of its effect in granulopenia.

There is thus a considerable body of evidence that folic acid is effective in the treatment of sprue and nutritional macrocytic anæmia. The evidence in pernicious anæmia is not so clear, since all SPIES's cases came from areas where nutritional deficiency is common—in fact, he was only satisfied that 3 of his patients had received an adequate diet. SPIES himself has noted patients who did not respond to folic acid but did respond to liver extracts that contained only a minimal amount of folic acid; he therefore thinks that folic acid is not the complete anti-anæmic factor. It is now essential that his work should be repeated as widely as possible; the value of a simple treatment of sprue in India can hardly be over-estimated. But repetition is hampered by the veil of secrecy that still obscures the nature of folic acid. If it has been successfully synthesised, as SUBBAROW and his colleagues claimed last year, why has its constitution not been published? It is difficult to conceive of American scientists lending themselves to deliberate secrecy for solely commercial reasons; their reaction to atomic research does not encourage that view. The alternative appears to be that subsequent work has not borne out the promise of the preliminary notice; then surely it will do no harm to air the difficulties. In the meantime, an intensely yellow material labelled folic acid is being distributed, and it is not known whether it is synthetic or prepared from liver or yeast.

Now SPIES and his co-workers have announced that a purine compound—5-methyl uracil, or thymine—can be substituted for folic acid in the treatment of pernicious anæmia [7] and sprue.[8] This substitution is based on the demonstration by SNELL and MITCHELL, and STOKSTAD,[9] that thymine can replace folic acid as a growth factor for lactic acid bacteria, provided that other essential substances, like adenine, are present. STOKES [10] showed that the bacterial cells grown with thymine contained no folic acid, and that the bacteria needed about 5000 times as much thymine as folic acid. He suggested that folic acid acts as an enzyme or coenzyme in the synthesis of thymine, or thymine-like compounds, and that this thymine is used in the building of nucleic acid. In conformity with these findings, SPIES has found that a very

1. See *Lancet*, 1945, ii, 855, and 1946, i, 427.
2. Spies, T. D. *J. Amer. med. Ass.* 1946, **130**, 474.
3. Darby, W. J., Jones, E., Johnson, H. C. *Ibid*, p. 780.
4. Zuelzer, W. W., Ogden, F. N. *Amer. J. Dis. Child.* 1946, **71**, 211.
5. Carruthers, L. B. *Lancet*, June 8, 1946, p. 849.
6. Endicott, K. M., Daft, F. S., Ott, M. *Arch. Path.* 1945, **40**, 364.
7. Spies, T. D., Frommeyer, W. B., Vilter, C. F., English, A. *Blood*, 1946, **1**, 185.
8. Spies, T. D., Frommeyer, W. B., Lopez, G. G., Toca, R. L., Gwinner, G. *Lancet*, June 15, 1946, p. 883.
9. Stokstad, E. L. R. *J. biol. Chem.* 1941, **139**, 475.
10. Stokes, J. L. *J. Bact.* 1944, **48**, 201.

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large dose of thymine is required for the treatment of macrocytic anæmia: 15 g. of thymine compared with 20 mg. daily of folic acid.

What we still need to know about folic acid and thymine is: will they produce a proper remission in patients with pernicious anæmia in temperate climates where no question of deficiency disease arises; will they maintain these patients in remission; and, once again, what is the constitutional formula of synthetic folic acid? SPIES claims no more than that "folic acid, a vitamin present in liver, yeast, and other materials, is a potent anti-anæmic factor in certain types of macrocytic anæmia in relapse." Whatever the limits of "certain types" are shown to be, it is clear that an important advance in the treatment of the macrocytic anæmias and tropical nutritional alimentary-tract disturbances is developing, and that new sources of information about the method of formation of the liver principle, perhaps the enzyme systems taking part, are appearing. We can only reiterate: "Full information please."

Problem Families

THERE is as yet no accepted definition of the problem family, but the Pacifist Service Units [1] which observed, and helped, 62 such families in Manchester, Stepney, and Liverpool have described its salient characteristics. Thus the family income is seldom higher than the allowance of a private soldier's wife, and is often irregular through chronic ill health of the bread-winner. Payments of all sorts are generally in arrears, but there is excessive expenditure on non-essentials such as alcohol, cinemas, and children's pocket-money. The family is badly housed, and uses the house badly: "sinks and lavatories are choked, windows broken and woodwork used for fire," and eviction notices and court orders are common but unheeded. Sleeping arrangements are congested, "4 to 7 in a bed," while "often rooms are left empty while the entire family huddles together in one room for warmth." The house is bare of minimum necessities, "kitchens are without even the traditional sofa and sideboard"; "bedroom furniture, even of the crudest kind, is exceptional and a cot or a pram a rarity." The family live in great disorder: "one may visit at ten in the morning to find the entire household asleep," or "sitting over the fire in the middle of the morning, the blind half-drawn and the gas just guttering out the last of its pennyworth, children in the underwear they slept in." School attendance is most irregular; children arrive late, ill-clad, lousy, unwashed, and without breakfast; often they are mentally deficient or educationally backward. Parental handling of the children is extremely faulty, leading to delinquency, disobedience, wildness, anxiety, frustration, physical and nervous exhaustion. There are no fixed meals at home, and filth abounds. About half the families lack one parent through death, war-service, desertion, or separation. "Their obtuseness of mind and degenerate habits . . . gain for them their reputation of hopelessness."

This incapacity to respond with any effort of their own to influences that might improve their condition distinguishes the problem family from the remainder, and much larger part, of CHARLES BOOTH'S "submerged tenth" with which they must not be identified. With all problem families ostracism is a constant difficulty: "landlords, officials, home visitors, all who have unsatisfactory dealings with them tend to treat them with disrespect." From these persistent foci of infection the dirt diseases, such as scabies and impetigo, are kept alive and spread abroad. Daughters of these wretched and ill-disciplined homes have little self-regard, acquire and spread venereal disease, or become mothers of illegitimate children. As STALLYBRASS [2] has said, the children of such families are morally and mentally stunted by neglect. SAVAGE [3] records that half the children are two or more years retarded, and that infant mortality in problem families is double that in control families. And each family presents a unique complex of circumstances.

Their influence on national life is out of proportion to their number; in Herefordshire one, and in Rotherham three, problem families per 1000 population have been reported,[2,3] and the total for England and Wales cannot exceed 80,000 families with about 320,000 children. Yet much of the apparatus for the prevention of child neglect exists to combat their effects.

When the Pacifist Service Units, sponsored by the Society of Friends, undertook the social repair of problem families which other organisations had found it impossible to reclaim, they did it by direct practical work—by cleaning up the home, reconciling estranged families, restoring self-respect. This is surely the right approach: to treat each member of the family separately, as his difficulties or misdemeanours bring him under different social agencies, while ignoring the home, is to treat the symptoms and leave the focus of disease untouched. Dr. C. F. BROCKINGTON (p. 933) supports this strongly: "What is required is someone who will take off his coat" (it will probably be her coat) "and get down to restitution of civilised conditions: thorough cleaning, with a measure of decorating and simple furnishing, followed immediately by practical instruction in housewifery, home-making, and parentcraft, and more remotely by prolonged supervision." He thinks there is need for a social worker, apt for the work and appropriately trained, who should be put in charge of only three or four such families at a time.

How is she to get access to the home? Dr. BROCKINGTON wishes to give the social worker a statutory right of entry, and would like local authorities to have the duty of maintaining a register of problem families. Apart from the fact that every local authority probably has its unofficial register of the kind already, it may be questioned whether statutory powers in this case would give the best results. It is true that registration would give us a clearer idea of the size of the problem, but the stigma of being on the register would be heavy. Besides, it is natural to resent being coerced into cleanliness. In any case, a social worker bearing such obvious blessings should need no threats to enforce her entry: even a mentally defective housewife should respond gladly to help with the cleaning, and to some redecoration and furnishing of her home.

That some legislative changes are needed, however, can hardly be questioned. As Dr. BROCKINGTON points out, our present laws are directed to removing the neglected child from his parents and placing him in different surroundings. Yet even a bad parent may

1. "Problem Families" 1945, by Pacifist Service Units, London.

2. Stallybrass, C. O. *Med. Offr*, 1946, 75, 89.
3. Savage, S. W. *Brit. med. J.* 1946, 1, 86.

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be loving; and for most children family love is more important even than soap and sanitation. Moreover, irresponsible parents who are relieved of the care of one batch of children often cheerfully generate some more. Too much social legislation can be almost as detrimental as too little, as two of the cases he quotes show: twenty-eight days in prison is odd treatment for ill health which has made a mother temporarily negligent; and a man who pays his rent regularly may feel that dirt in his home is his own affair. In each of these cases a social worker of the type suggested by Dr. BROCKINGTON might, if introduced tactfully in the home, have kept the family together and independent. His suggestion that families might be put on probation has much to recommend it. Probation has already proved its worth in the care of the young offender, and problem parents have much in common with children. If, at the time of placing the family on probation, the magistrate could recommend to the parents the services of the new type of social worker, and could introduce the family to her there and then, she should have little need of statutory backing: the parents would see in her the hope of weathering probation successfully, and of retaining the care of their children—a natural and common wish.

The problem is not economic but social—perhaps even a human, personal problem. The Society of Friends have shown that such families can be reclaimed by means of "a personal relationship, optimistic but not sanguine, tirelessly patient, rejecting no situation as hopeless." The Government, in the accepted manner, can now follow in the footsteps of a voluntary body.

Curability of Cancer

THE Holt Radium Institute draws its patients from a large area in north-west England, and it maintains, with reason, that the vast majority of the people who develop cancer in a population of nearly 4,000,000 pass through its organisation. Its statements, therefore, are authoritative. The institute's *Second Statistical Report*,[1] now published, analyses the results of treatment in patients first seen between 1934 and 1938. During that period 9130 patients were seen and 6380 were treated wholly or in part by radiation—radium and deep X rays. The first part of the report deals with "the curability of certain forms of cancer." This is an encouraging sign of the new approach to the problem of cancer which has slowly been gaining ground during the past years, and the authors of the report base their claims on a table in which they show that, of the 6380 patients treated for cancer, 2186, or 40%, were alive and free from signs of recurrence at the end of five years. Admittedly this total includes few patients suffering from cancer of the alimentary tract or of other sites which are at present unsuitable for radiotherapy—skin, breast, uterus, and mouth naturally predominate—but they do give an added impetus to those who claim that cancer is essentially a curable disease. That is the encouraging feature of this report.

There is, however, a second moral to be drawn from another table. Here we are told that of those patients who came for treatment when the disease was still in an early stage—about a quarter of the total—87% were alive and free from recurrence five years after treatment, while of those patients who attended first when the disease was advanced—again a quarter of the total—7% were alive and free from recurrence after a similar period; the intervening stages occupied intermediate places in the table. This is the horrifying side of the picture, and comparison with other published results shows that the sample does not suffer from undue selection. For example, the report on the results of radiotherapy in cancer of the uterine cervix, collated in 1939 and since published by the Health Organisation of the League of Nations, reveals that of the 10,970 patients treated for this complaint in eighteen hospitals in Europe and America, 1280, or 11%, were first seen when the disease was in an early stage, and 56% of these were alive and free from recurrence at the end of five years; while of the 2200 patients, a fifth of the whole, who were first seen when the disease was advanced, under 5% were alive and free from recurrence after that time. Of the patients who fail to attend for treatment at a curable stage very few have had no warning symptoms until the disease was too advanced for treatment.[2] There is in many, if not most, histories a story of "something wrong" extending over several months before the patient seeks advice. In some cases this delay may arise because the symptoms seem trivial and are therefore ignored, but often, particularly where the cancer is of an exposed site, it is probably the fear of having their worst suspicions confirmed that holds patients back; not so much the fear of the disease as the fear of being told that they have the disease.

How can this negative attitude be altered? The best way seems to be by telling people the truth about the curability of cancer. This can be done by broadcasts, lectures, and articles by informed sensible people, and by posters and films which will explain what is meant by cancer, will demonstrate that patients who seek advice as soon as they feel something wrong stand an immeasurably better chance of living than those who wait, and will emphasise that treatment does not necessarily mean a severe mutilating operation. Radiotherapy, in proper hands, is accompanied by only the slightest constitutional disturbances, and most patients do not need a long stay in hospital. But both radium and deep X rays are dangerous weapons, and no-one who has seen the result of ill-applied or inexpert radiation will want to repeat the experience. By these means of frank discussion alone will patients be encouraged to come early for treatment. In the United States propaganda is carried a good deal further than in this country. The American Cancer Society has organised a series of Cured Cancer Clubs, where patients who have survived five years free from recurrence meet and speak in public of their experiences; in Ceylon, too, there has recently been a series of intelligent well-informed broadcasts on the subject; and examples could be multiplied. It has been objected that such methods will lead to widespread cancer phobia. In countries where they have been attempted there is no evidence that this is so. Reports from the

1. Compiled by R. Paterson, M. Tod, and M. Russell. Edinburgh: Livingstone. Pp. 147. 7s. 6d.

2. See *Rep. publ. Hlth med. Subj., Lond.* 1931, no. 66; 1939, no. 89.

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states in America where propaganda has been most active claim that the attendances at clinics of patients with cancer at an early treatable stage have greatly increased as a result. For example, in Massachusetts the delay in seeking advice has been reduced from six months to something under four, while in Connecticut there has been a 5% improvement—from a fifth to a quarter of all patients treated—in the five-year-survival rates as a result of patients attending for treatment earlier. This must to some extent result from judiciously applied propaganda.

It would be folly to claim that every patient suffering from cancer could if seen early be cured—there are other factors still unknown which would prevent that—but early diagnosis and prompt treatment would undoubtedly lead to a substantial increase in survival-rates, and this end can only be attained by proper education of the public.

Birthday Honours

MEDICINE receives its fair share of the honours announced on the King's birthday. The peerage conferred on Sir Ambrose Woodall, surgeon to the trades-union hospital at Golders Green, gives welcome reinforcement to the strength of the profession in the House of Lords. Lieut.-General Gordon Wilson's performance of a herculean task as director of medical services in India is recognised by a knighthood in the order of the Star of India. Of the five Service doctors appointed K.B.E., Major-General A. G. Biggam, consulting physician to the Army, has earned and won the confidence of his associates, both temporary and Regular, both young and old; Brigadier Hugh Cairns, president-elect of the Association of Surgeons, has steadily extended his influence on neurosurgery, and the solid reputation which he first acquired as a disciple of Harvey Cushing; Air Vice-Marshal J. J. Conybeare, of Guy's, is continuing as civilian consultant in medicine to the Royal Air Force his happy and useful association with that Service during the war; Air Marshal Andrew Grant has lately succeeded to the important post of medical director-general at the Air Ministry; and Surgeon Vice-Admiral C. P. G. Wakeley, of King's College Hospital, editor of the *Medical Press and Circular* and editorial secretary of the *British Journal of Surgery*, demonstrates that it is possible to do many diverse things well yet still appear cheerful. Dr. H. C. Sinderson, a civilian K.B.E., is largely responsible for the remarkably flourishing state of the faculty of medicine in Bagdad. Of the knights bachelor, Major-General Gordon Covell is director of the Malaria Research Institute of India at Delhi; Dr. Andrew Davidson has made a notable success of his work as chief medical officer in the Department of Health for Scotland; Dr. P. N. Panton, by his quiet but undefeated efforts to arrange pathological services throughout the country, has in the past six years done more perhaps than any other man to raise the standard of British medicine; and Prof. Leonard Parsons has proved himself a leader and a good colleague alike in pædiatrics, in medical education, and in professional affairs. These recipients of honours have been happily chosen and the list of new companions, officers, and members of the orders of chivalry contains many other distinguished names.

THE following have been elected members of the General Medical Council for the next five years: Dr. H. G. Dain, Sir Kaye Le Fleming, Mr. Noel Waterfield, Dr. J. Wardle Bone, and Dr. E. A. Gregg, representing the registered medical practitioners in England; Dr. R. W. Craig, representing the registered medical practitioners in Scotland; and Dr. Frank Kane, representing the registered medical practitioners in Ireland. The results of the voting will be found on p. 947.

Annotations

SAFEGUARDING THE DOCTOR

LAST year the London and Counties Medical Protection Society received 1040 applications for advice. Its report for 1945 is the first full annual report to be published for six years, and during that time membership has increased by over 4000 and the funds of the society by £32,000. The end of the war has brought some unaccustomed problems: the society has advised members who have been on active service and have returned to find that complications have arisen in their partnerships. This is not strictly within the society's scope, and though advice is given willingly, no other proceedings can be undertaken, except arbitration. Successful appeals have been made to the responsible authorities when doctors returning from the Forces have not been reinstated in their pre-war appointments. All newly qualified doctors should join a protection society, and this report reminds them that the London and Counties waives the entrance fee for them. Members of the public-health service also need protection, for the usual defence of a local authority or hospital, in a court case, is that having employed a qualified practitioner they have fulfilled their obligations; and this defence usually holds good, so that the action is transferred to the doctor. The society undertakes such cases, and will also advise members who are having difficulties with employing authorities. Service doctors, too, may have actions brought against them on professional grounds; or complaints may be made to senior officers against them, and in such events the advice of the society may prove useful.

When a court case is undertaken the society pays all the member's costs, whether he is plaintiff or defendant, and whether he succeeds or not. In successful cases the society may be awarded costs against the other side, but never recovers all of them, and in most cases gets none. In unsuccessful cases the society, besides covering the member's costs, pays all his damages up to an unlimited amount. When damages are awarded to a member, however, the society does not retain any part of them: the member receives the entire sum. A standing joint committee of this society and the Medical Defence Union has existed for some years, to deal with actions affecting members of both bodies, and with matters of interest to both. In 1945 a committee made up of representatives from these two bodies and the Medical and Dental Defence Union of Scotland was established, and it expects to do useful work.

Besides the recommendations for the reform of the General Medical Council which we reproduce on p. 936, the report contains much advice and information—on certification, notifications to public authorities, professional evidence, fees as witnesses, national health insurance, and the Rent Restrictions and Emergency Powers Acts. A collection of "interesting cases"—rather gruesome little case-histories of doctors' dilemmas and their outcome—completes an informative and on the whole reassuring document.

BURNS TREATED IN PLASTER

BY demonstrating the importance of the capillary damage resulting from a burn Underhill and his colleagues[1] in 1930 diverted attention from the search for a hypothetical toxin as a cause of the serious systemic reactions following this type of injury. The loss of circulating fluid was enough to account for the grave disturbances arising from extensive burns; and for some years the efficacy of coagulating agents in treatment was believed to reside in their power to arrest the loss of fluid from the burnt surface. It was later realised that the greater part of the fluid lost from the blood

1. Underhill, F. P., Kapsinow, R., Fisk, M. E. *Amer. J. Physiol.* 1930, 95, 325.

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went into the skin and subcutaneous tissues. With the object of preventing this, treatment by simple pressure dressings was tried and favourably reported on by Siler and Reid [2]; the same end could be achieved by the use of rigid dressings, such as plaster-of-paris casts. The reduction in fluid loss from injured capillaries by the immediate application of a cast was clearly demonstrated experimentally by Glenn et al.[3] With proper care the arterial circulation to the enclosed limb was not embarrassed, and in dogs it was found that experimental burns that had never been allowed to swell healed more rapidly than untreated controls. Cameron and others [4] have reported similar results with a larger series of goats which were submitted to carefully controlled burns by moderate heat. The application of plaster casts within 4 hours of burning prevented fluid loss and greatly reduced hæmoconcentration in comparison with untreated controls. The general condition of the animals 24 hours after injury was distinctly better in the group treated in plaster casts. In a second series they showed that burns that had been enclosed in plaster healed more rapidly than those treated by simple dressings. Smaller groups were kept in plaster for 6, 9, 16, and 30 days, but no differences were noted among these groups in the time taken for complete healing. On the other hand, when the casts were removed within 4 days of the burn, swelling immediately took place. The explanation of the difference in the rate of healing is almost certainly that far more reparative tissue is needed for those limbs that have been allowed to swell and in which a collection of coagulated exudate has to be organised and disposed of by the surviving tissues. These findings must be applied with reserve to man, particularly because in both goats and dogs bacterial infection does not appear to delay healing significantly. Meanwhile, the possibility that some toxic factor may be generated in the burnt tissues should not be neglected. A dressing that immobilises the burnt area may also help to prevent the rapid absorption of any such substances liberated into damaged tissues.

RADAR AND STERILITY

At one time a rumour circulated widely in the Services that long exposure to the electromagnetic radiations used in radiolocation was harmful. Some said they caused baldness, others sterility, but no-one produced a well-authenticated example of their harmful effects. It was not inherently improbable that these radiations would have a biological effect, since in other parts of the electromagnetic spectrum the radiations known as heat, light, ultraviolet rays, and X rays all have such effects. Electromagnetic waves with frequencies of the order of 20,000 kilocycles per sec. (wave-length 5 metres) will kill bacteria and tissue-cultures, and Nyrop [5] maintains that they exert a specific action distinct from their heating effects. Jackson [6] suggests that living matter, like water, might selectively absorb high-frequency radiations of certain definite wave-lengths, so that radiations of a particular wave-length would heat, for example, glandular tissue more effectively than others of the same field-strength. There was thus an obvious need for experiment, and the need did not end with the war, for wireless radiations with a wave-length of about 10 cm. are likely to be increasingly applied to civilian as well as military purposes.

Early in the war volunteers of the United States Navy were exposed to high-frequency radio waves for long periods with no ill effects except temporary headache. Now a more convincing experiment has been carried out on guineapigs by R. H. Follis at the Aero Medical Laboratory at Wright Field. He exposed 13 male guineapigs to 10 cm. radiation for three hours daily for 51–53 days (the field-strength is not given in the brief summary issued by the Surgeon-General's Office). They were then killed and submitted to autopsy. There was no loss of hair, no evidence of damage to the reproductive organs, and, in fact, no detectable abnormalities whatever. Presumably the electromagnetic field to which the guineapigs were exposed was designed to imitate that in the vicinity of a radar transmitter. So these observations, in conjunction with the absence of reports of definite ill effects in the large number of Service men and women who worked with radar installations during the war, support the view that ultra-short wireless radiations will do no harm provided the customary precautions are taken, though they by no means exhaust the subject.

SPECIFIC TREATMENT OF ACUTE NEPHRITIS

Acute nephritis is often associated with a focal infection, especially of the upper respiratory tract, so the advent of chemotherapy was expected to provide a valuable weapon in the control of this disease. Early reports tended to be over-enthusiastic, and Rapoport, Rubin, and Waltz [1] have provided a valuable corrective in their careful study of 33 children with acute glomerulonephritis treated with sulphanilamide and compared with a control group of 40 children treated similarly in all other respects. The original sulphanilamide was used first because the study was begun in 1938, when this was the drug of choice, and subsequently because of the possibility of renal complications with the later preparations. In the assessment of results particular attention was paid to the Addis urinary sediment counts. All the children in both groups recovered completely from their renal disease, and there was no significant difference in the duration of the renal inflammatory process or of the disturbed renal and cardiovascular functions in the two groups. The sulphanilamide had no demonstrable deleterious effect on the kidneys. The dosage was 1 grain per pound body-weight daily for five days, following an initial dose of half the calculated total daily dose; then a continuation course of half the standard dosage for a further fifteen days; and finally a maintenance dose of gr. 10–20 daily for a variable period of two to six weeks. Blood examination showed an adequate concentration. Despite the apparently negative results, Rapoport and colleagues urge that the treatment of infections in patients with nephritis by means of sulphonamides is rational therapy.

The disadvantages of sulphonamide therapy are partly overcome by using penicillin, which has no toxic actions on the kidney. Moncrieff [2] advocated the use of this drug in acute nephritis two years ago and doubtless it has often been employed since then. Sen [3] has lately reported 12 cases from India, all children with severe acute nephritis. Using a solution containing 10,000 units per c.cm., he gave injections of 5000–10,000 units three-hourly or four-hourly, with a total dosage ranging from 192,000 to 640,000 units over a period of three to eight days. Of the 12 cases, which were chosen for their severity, 8 made a complete recovery, 1 died, and 3 are classified as "doubtful" or "satisfactory" because abnormal constituents still remained in the urine at the time of the report. It is interesting to compare these results with the American series treated with sulphanilamide in which all the children, treated and controls, recovered completely, and also with the figures given by Ellis [4] for his 225 cases of type I nephritis. Here the recovery-rate was 82%, with death in the acute stage in 4%,

2. Siler, V. E., Reid, M. R. *Ann. Surg.* 1942, **115**, 1106.
3. Glenn, W. W. L., Gilbert, H. H., Drinker, C. K. *J. clin. Invest.* 1943, **22**, 609.
4. Cameron, G. R., Allen, J. W., Coles, R. F. G., Rutland, J. P. *J. Path. Bact.* 1945, **57**, 37; *Ibid*, 1946, **58**, 1.
5. Nyrop, J. E. *Nature, Lond.* 1946, **157**, 51.
6. Jackson, W. *Lancet*, April 6, 1946, p. 519.

1. Rapoport, M., Rubin, M. I., Waltz, A. D. *Amer. J. med. Sci.* 1946, **211**, 307.
2. Moncrieff, A. A. *Lancet*, 1944, ii, 706.
3. Sen, S. *Amer. J. med. Sci.* 1946, **211**, 289.
4. Ellis, A. *Lancet*, 1942, i, 1, 34, 72.

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a rapid progressive course in 4%, and a slowly progressive course—albuminuria persisting as in Sen's "doubtful" cases—in 10%. Ellis collected his cases before chemotherapy was introduced, and it seems fair to conclude that the new weapons have made no difference to the outlook in acute nephritis, except that a focus of infection can be more readily eliminated.

MALNUTRITION IN THE CANADIAN NORTH

THE survey of nutrition among the Northern Manitoba Indians, organised by the Indian Affairs Branch of the Canadian Federal Department of Mines and Resources in 1942, revealed such a terrible state of affairs that to anyone who does not know the long history of the endeavours to benefit the Indian it appears as a damning indictment of a rich government. The report now published [1] deals with that half of the 120,000 Canadian Indians who live by hunting, trapping, and fishing, commonly called "Bush Indians"—a comprehensive name for the remnants of many tribes. The survey was confined to an area 350 miles north of Winnipeg, with a population of 2500. For 1942 their infant mortality-rate was nearly 400 per 1000 live births, and their crude death-rate 39·04 per 1000, with a tuberculosis mortality of 1400 per 100,000. The ten leading causes of death among all Canadian Indians are tuberculosis 761 per 100,000, pneumonia 383, diseases peculiar to the first year of life 177, violent deaths 174, diseases of the heart 172, influenza 126, diarrhœa and enteritis 110, cancer 94, senility 74, whooping-cough 66. The high proportion of deaths from respiratory diseases may be associated with the low fat intake. The Indian is forsaking the wigwam and living packed in shacks, as many as 10–12 people in a shack 12 feet square, the sole source of ventilation being the stove and hole for the stove-pipe in the flat roof. Poor housing, inadequate sanitation, and the rigours of climate play a part in the bad state of health revealed, but the report concerns itself mainly with the nutrition of the people.

The diet of the Indians studied consists chiefly of flour, lard, and sugar bought to supplement the berries, game, and fish they obtain while hunting. The food purchased gave a value of 1420 calories daily per head, 885 of which came from the flour, 246 from lard, 127 from sugar and jam, and the remaining 162 calories from small quantities of bacon and dried salt pork, rolled oats, baker's bread, butter, beans, evaporated milk, rice, &c. The available nutriments are listed as 34 g. of protein, 40 g. of fat (mostly lard), calcium 103 mg., iron 9 mg., vitamin A 238 I.U., thiamine 0·35 mg., riboflavine 0·25 mg., nicotinic acid 3·8 mg., and ascorbic acid 1 mg. Among the 400 Indians examined (records were kept for 215) no advanced stages of nutritional deficiencies such as keratomalacia, beriberi, pellagra, scurvy, or rickets were found. Conjunctival changes were constantly seen. Of 194 adult Indians recorded all had thickness, opacity, and discoloration of the conjunctiva, and pterygia were present in 11%. The only symptoms complained of were burning and gritty sensations in the eyes, lacrimation, photophobia, and lack of sharpness of vision. In 4% of the Indians examined congestion of the ocular limbic plexus and conjunctiva was noted, and these people all complained of snow-blindness. Examination with the biomicroscope by Dr. H. D. Kruse showed proliferation of blood-vessels into the cornea in all the Indians examined, whether or not they had congestion of the conjunctiva. In 10% there was an acute gingivitis; 81% had a subacute inflammation of the gums, and all were long in the tooth or showed other chronic changes. No scurvy was seen. None of the Indians had the strikingly red tongue of pellagra but almost all showed atrophic lingual papillæ and fissures. About 1 in 5 had diminished or absent tendon reflexes.

The surveyors blame the poor diet, which was deficient in almost every nutritional factor studied, for the Indians' ill health, and Dr. Kruse postulates a lack of vitamins A, B_2, and C in particular. But the main interest of the report lies in the reasons for the partial failure of nearly 200 years of conscientious effort. The rights of the Indians were recognised in the time of Charles II, more than a hundred years before the American Revolution. An office for Indian affairs which was established in 1755 moved to Canada and continued its work there after the Revolution. The funds of this office now amount to 14 million dollars and it controls 5 million acres for the benefit of 120,000 people. On face value it would appear that the Indians of Canada are as lucky as any people on earth. Yet in the United States, where Indian rights existed mostly on paper until 20 years ago and the last Indian war occurred as late as 1890, the Indians seem to have fared better; and south of the Rio Grande, where Indians were taught that the only rights they had were in the next world, they have flourished and waxed strong and self-reliant.

The hunting Indians of the North have gone through three dietetic phases since the coming of the white man. In the first phase, that of competition by fur buyers, with rum as the trading currency, their health undoubtedly suffered; in the second, that of monopoly by the Hudson's Bay Company, their health improved; and the results of the last phase, that of competition by fur buyers with white flour and sophisticated goods as currency, are shown in this report. The authors of the report remark on the better health and greater size and vigour of the Indian 40 years ago compared with his indolent, shiftless, and unhealthy descendant of the present day. How does the diet differ? The Indian of 40 years ago used to eat the entire animal. One traveller watching rations being given to a tribe remarked on how they liked tripe and left nothing of an ox except the hooves and horns; another on how they boiled the fish they ate uncleaned and drank the water it was boiled in; also less lard and more beef fat and pemmican entered into the diet of former times. Why did the diet change? Partly no doubt because of the fierce competition for furs, which severely depleted the game while supplying more flour and lard. But is this another example of the undiscriminating interference with food habits which killed the babies of Nauru; and were their devoted teachers, having been brought up in nice clean parlours with tea and cakes, so struck by the horror of a diet of blood and guts that they exorcised this habit as well as sundry devils?

1. Mare, P. E., Kruse, H. D., Tisdall, F. F., Corrigan, R. S. C. *Canad. med. Ass. J.* 1946, **54**, 223.

MINISTRY OF HEALTH

As chief medical officer of the Ministry of Health, Sir Wilson Jameson has two deputies, Sir Weldon Dalrymple-Champneys and Dr. J. A. Charles. Below the deputy chief medical officers a new rank, that of principal medical officer, has now been instituted, and those appointed as from the beginning of this year are Dr. Melville Mackenzie (in charge of epidemiology and international health), Dr. R. E. Whitting (in charge of the Insurance Medical Service), Dr. C. F. Good, Dr. T. S. McIntosh, Dr. E. L. Sturdee, and Dr. T. W. Wade (Welsh Board of Health). Next in rank to the principal medical officers will be the senior medical officers—namely, Dr. A. L. Banks, Dr. N. R. Beattie, Dr. W. H. Bradley, Dr. E. Donaldson, Dr. C. J. Donelan, Dr. R. E. Ford, Dr. G. E. Godber, Dr. N. M. Goodman (appointed in absentia), Dr. W. D. Hopkins, Dr. A. E. Huxtable, Dr. G. C. Kelly, Dr. W. A. Lethem, Dr. C. T. Maitland, Dr. F. N. Marshall, Dr. E. Martin, Dr. F. Murchie, Dr. H. A. Raeburn, Dr. D. M. Taylor, and Dr. R. O. C. Thomson.

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Special Articles

HOMELESSNESS IN CHILDREN

CAUSES AND PREVENTION

ANALYSIS OF UNPARENTED CHILDREN IN THREE ENGLISH COUNTIES

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CHILDREN may become homeless from many causes of which the following are the chief:

(1) *Death of Parents.*—Where one or both parents have died this would usually be considered to be the main cause, although neglect and abnormal behaviour may follow.
(2) *Insanity* of one or both parents, including mental deficiency of a degree requiring institutional care.
(3) *Desertion* by both parents or by one if the other is in the Forces or elsewhere away from home.
(4) *Removal to care* and protection of the local authority for one of six reasons—
  (*a*) Sloth and/or neglect.
  (*b*) Immoral behaviour which the magistrates consider to place the child in moral danger.
  (*c*) Cruelty, on an order of the magistrates, usually accompanied by committal of parents to prison.
  (*d*) Destitution, where there is no home because the father and mother are incapable of finding and maintaining one or because of ejection.
  (*e*) Lack of parental control.
  (*f*) Illegitimacy where the mother is single or married.
(5) *Delinquent children* ordered to the care of the local authority by the magistrates.

Table I shows under these headings the children in the care of the county council in three English counties: Durham, industrial; Lincoln (parts of Lindsey), agricultural; and Warwickshire, semi-industrial. A closer analysis of the figures for Warwickshire is given in table II. The children were mostly in public-assistance homes and institutions, together with a few boarded out by the local authority. Child-life-protection children supervised by the welfare authorities when fostered for gain have not been included, nor have certified mental defectives, children in approved homes, and short-stay cases removed temporarily because of illness or other temporary reasons at home. There are difficulties in producing comparable figures for different areas with different assessors; and, although the general picture presented is certainly accurate, no strict reliance should be placed on a comparison between subgroups. It is, for example, difficult to believe that the magistrates in the three counties have dealt with such a divergent number of instances of immorality.

TABLE I—ANALYSIS OF CHILDREN IN THE CARE OF THE COUNTY COUNCIL IN THREE COUNTIES

Reason	Durham		Lindsey		Warwickshire	
	Number maintained					
		%		%		%
Death of one parent	23	(4·0)	34	(10·4)	27	(9·2)
Death of both parents	20	(3·5) (7·5)	10	(3·1) (13·5)	6	(2·1) (11·3)
Insanity of one or both parents or mental deficiency of a degree requiring institutional care	27	(4·7)	27	(8·2)	54	(18·4)
Desertion of parents	38	(6·6)	50	(15·2)	28	(9·5)
Removed to care and protection because of unsuitability of environment due to—						
Sloth and/or neglect	99	(17·3)	122	(37·2)	58	(19·7)
Immorality	..	..	10	(3·1)	56	(19·0)
Cruelty	24	(4·2)	2	(0·6)	10	(3·4)
Destitution	159	(27·7) (81·0)	20	(6·1) (63·1)	30	(10·2) (59·8)
Lack of parental control	110	(19·2)	23	(7·0)	9	(3·1)
Illegitimacy	72	(12·6)	30	(9·1)	13	(4·4)
Delinquent children	1	(0·2)	..	..	3	(1·0)
Total	573		328		294	

The figures show that *insanity*, *desertion*, and *death* of the parents accounted for roughly a third of the children: Warwickshire 115 of 294 (39%), Durham 108 of 573 (19%), Lindsey 121 of 328 (37%). The remaining two-thirds were removed from their parents on the initiative of the local authorities or by order of the magistrates.

The 176 children removed to a place of safety in Warwickshire were classified as follows: *sloth and/or neglect* 58, *immorality* 56, *destitution* 30, *cruelty* 10, *lack of control* 9, and *illegitimacy* 13. There were also 3 delinquents. Other delinquents which were sent to approved schools under the Home Office were not included in the survey. The following case-notes from Warwickshire are illustrative of the different groups of classification.

TABLE II—HOMELESS CHILDREN IN THE CARE OF WARWICKSHIRE COUNTY COUNCIL (during one week of survey, July, 1945)

Cause	Ages (years)			Total			Adopted under sect. 52 of Poor Law Act, 1930	
				Children		Families		
	0–5	6–14	15–18	Illeg.	Leg.		Children	Families
Death of one parent	4	17	6	7	20	15	3	3
Death of both parents	..	..	6	..	6	5	..	..
Insanity*	19	31	4	31	23	38	6	3
Desertion of parents	3	23	2	12	16	17	..	..
Removed to care and protection—								
Sloth and/or neglect	12	44	2	12	46	19	13	5
Immorality	8	40	8	22	34	24	16	7
Cruelty	4	5	1	2	8	5	..	..
Destitution	2	24	4	3	27	10	1	1
Lack of parental control	..	5	4	2	7	6	1	1
Illegitimacy	..	9	4	13	..	12	2	2
Delinquent children	..	2	1	..	3	2	..	..
Total	52	200	42	104	190	153	42	22

* Insanity of one or both parents or mental deficiency of a degree requiring institutional care.

CRUELTY OF PARENTS

Family 1.—Five children. Father a ne'er-do-well. Mother died of phthisis after childbirth. Eldest girl, just 14, looked after the family, and home conditions got very bad. Father had fiery temper, thrashed children severely, and finally wounded eldest girl with knife so that she was admitted to hospital. Magistrates ordered removal of all children, and father imprisoned.

ILLEGITIMACY

Family 2.—Unmarried mother, a maid at a hospital, is of poor mental capacity. Illegitimate boy, aged 8, in public-assistance institution because she cannot look after him adequately and retain her job. Mother visits the boy and takes him out; is very good to him.

DESTITUTION OF PARENTS

Family 3.—Five children, aged 14, 13, 10, 9, and 7, in public-assistance children's home. Father, mother, and 8 children occupied a council house in a village and were evicted in 1938 by a rural district council for not keeping the house in a fit state of cleanliness. No rent owing. Family admitted to institution. Father discharged and lived outside, earning living; mother remained as maid in institution; 3 children grew up and were discharged to employment. Rural district council offered another house in 1940 if public-assistance committee would guarantee rent, but this could not be granted, because the father was able-bodied. The master of the institution considers the family respectable and capable of having own home.

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Family 4.—Three children, aged 11, 9, and 7, in public-assistance children's home. Father and mother living outside in one room with fourth child. Ejected by order of the court from farm cottage in October, 1944, two years after the father had left the employ of the farmer to whom the cottage belonged. Father had found more remunerative war work; he could find no other accommodation. The master was of the opinion that a home could be established.

Family 5.—Five children, aged 12, 8, 7, 6, and 3, in different children's homes in the county. Father dead; mother and children bombed out of London. Evacuated to Peterborough under the evacuation scheme, where found too dirty for billeting, and family transferred in September, 1942, to Warwickshire as mother's place of origin. The mother has since been discharged and is out at domestic work but cannot earn enough to establish and maintain a home.

SLOTH AND/OR NEGLECT OF PARENTS

Family 6.—Five children, aged 11, 9, 8, 7, and 5, in different homes in the county. The N.S.P.C.C. prosecuted in 1942 for general neglect, and the children were removed from the parents and admitted to public-assistance institution as a place of safety. All the children were adopted under section 52 of the Poor Law Act. Father partially disabled by 1914–18 war wound. Mother went out to work. Cottage insanitary and condemned by local authority under the housing acts. Owing to disablement and large family, income was insufficient and family gradually went downhill from about 1938. Much might have been done to prevent the decline.

Family 7.—Six children, aged 10, 10, 9, 5, 4, and 1. N.S.P.C.C. asked the public-assistance authority to take the children into a place of safety. The mother was in poor health, and the father a farm labourer. The farmer said he had no complaint and was surprised at their removal. Court ordered parents' imprisonment for 28 days on opinion alone of N.S.P.C.C. officer, who said he formed his opinion on one visit after report of neglect from private source. Health visitor's opinion is that the situation was due to mother's poor health and temporary, and family should not have been removed.

Family 8.—Five children, aged 12, 8, 7, 4, and 7 months. N.S.P.C.C. asked if education committee would act as fit person. Court ordered removal and mother to prison. Father works at cement works, and family lived in a country village. This was a typical slothful wife with ne'er-do-well husband, whose condition deteriorated over several years. Finally the woman took to going out and leaving the children unattended. After the term in prison the parents lived together in a neighbouring town, when the mother was reported to be living an immoral life.

IMMORALITY OF PARENTS

Family 9.—Four children, aged 14, 11, 6, and 4. Family were brought before juvenile court, which ordered removal of children as "parents were not fit to exercise care or guardianship because of their conduct."

Family 10.—Four children, aged 12, 10, 8, and 6. N.S.P.C.C. prosecuted in 1944. Mother frequently out late at night and leading an immoral life. Father in Forces. Three children illegitimate. Mother sentenced to a month's imprisonment.

LACK OF PARENTAL CONTROL

Family 11.—A child, aged 10, was admitted to an institution in November, 1941. Reported by health visitor to N.S.P.C.C. Father elderly, mother left him, father then unable to control child, who was difficult, probably owing to home circumstances.

Family 12.—A child, aged 6. Father deserted. Mother and child taken into public-assistance institution. Mother now discharged, working from lodgings, unable to control child, who remains in institution.

NEED TO PRESERVE FAMILY UNIT

We must accept as our guiding principle that the family unit should, wherever possible, be preserved. Except where children have been adopted at an early age the natural parent must always exercise most influence over a child's mind. Parental love is so deep-rooted, in fact physiological, that it cannot be easily extinguished, and it must outweigh many disadvantages in home care. To nearly all children, no less than to parents, it must be the most powerful incentive to abstain from wrong-doing, to resist temptation, and to achieve a good standard of citizenship.

Circumstances may arise in which a mother's or a father's love cannot compensate for the absence of civilised conditions or for the corruption of immoral suggestions; this may come about, whatever steps are taken. Deliberate cruelty by parents also causes such mental as well as physical injury, that enforced separation seems to be the only course. In the case of a single girl, particularly if of poor mentality and earning capacity, again there is often no alternative to separation when she ceases to be capable of looking after her child, and little can be done to prevent this, when a child has been born out of wedlock, except carefully supervised adoption; the risk of this final outcome must be carefully considered by those caring for the mother and child at the time of the birth. Thus we cannot escape from the fact that removal of children to care and protection is often inevitable, but we must not therefore accept that no form of prevention is possible. The importance of devising ways and means to preserve the family is paramount, and a small measure of success should be accounted justification.

There is a sharp distinction between causes which, like death, desertion, and insanity of the parents, are completely unavoidable, or like cruelty and illegitimacy, are relatively unavoidable, and those of destitution, neglect, and, in less degree, immorality, and lack of parental control, which might respond to social-welfare measures. It is the families in which these causes appear that contribute such a large proportion of children. Three—namely, neglect, immorality, and destitution—together accounted for about half of the children: 144 of 294 (49%) in Warwickshire, 258 of 573 (45%) in Durham, and 152 of 328 (46%) in Lindsey. These large numbers of children belonged to only a fifth to a third of the total families (53 of 153 families in Warwickshire, 70 of 337 in Durham, and 53 of 166 in Lindsey).

Can nothing be done to prevent families from falling into such a desperate plight that the State must intervene and take away their children? Is there no possibility of setting up welfare machinery that will support these weaker members of the community and assist them to fulfil their obligations like civilised beings?

PREVENTION

As a basis of action the following four suggestions are made: (1) registration of all problem families; (2) institution of measures to rehabilitate problem families; (3) changes in the law to make it possible to supervise the family; and (4) a new approach to delinquency by the magistrates.

(1) *Registration of Problem Families.*—Problem families is a term covering the six forms of ne'er-do-wells from which "place-of-safety" children come. They are more extensive in the community than the number of unparented children suggest, and there are in any area possibly twice the number which have not been brought before the magistrates or public-assistance authorities. Owing to the large size of the families they may contain up to 5% of the school-child population. All include potentially homeless children, and years may pass before conditions become so bad that action by the authorities is inevitable. The first step is to ascertain how many such families exist, and for this a statutory registration is suggested. Most authorities already possess much information of such types of family, and no great difficulty should be experienced in completing a register with the assistance of the health visitors. The fixing of a standard will present difficulty; and, if registration is to carry with it a statutory right of entry for professional staffs, care will be required in its formulation, and a right of appeal provided. With the completion of such a register the extent of the problem throughout the country will become known and the planning of effective action made possible.

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(2) *Rehabilitation of Problem Family.*—The most important step is to remedy the conditions at an early stage before the downward process has gone too far to be checked. Where a family is destitute, money and effort will be better spent in finding and fitting out a home than in supporting children over a long term of years in an institution. It is certain that much could be done to provide the destitute with homes if this step were accepted as the desirable thing and duties were placed upon authorities with power to spend money which might be grant-earning or reimbursable.

For the families classified under "sloth and neglect" there is now no effective effort to prevent the development of the circumstances which finally bring the family to ruin. Health visitors and cruelty inspectors often visit to cajole and threaten, with the backing of other colleagues in the field of social medicine—e.g., the sanitary inspector and the medical officer of health. Yet it is apparent to anyone who visits such families living in conditions more suited to pigs than human beings that such censorial visits are of no real value once the family has sunk below a certain level of existence. What is required is someone who will take off his coat and get down to restitution of civilised conditions: thorough cleaning, with a measure of decorating and simple furnishing, followed immediately by practical instruction in housewifery, homemaking, and parentcraft, and more remotely by prolonged supervision. Local authorities should be required to appoint social workers with special training and aptitude for this form of work, which is quite different from anything that the health visitor, sanitary inspector, or relieving officer could undertake. Such skilled persons should be responsible for only a few homes each, so that sufficient time could be given to personal instruction. Only by such close personal and skilled supervision can we expect to raise living standards or prevent their decline to the deplorable conditions which make removal of the children necessary.

Where immorality and lack of parental control are the main causes, more difficult problems are set, and the possibilities of preventing family catastrophes may be less; yet close supervision by skilled social workers and a determination to set the home to rights before things have gone too far might give surprisingly good results.

It will be said that such forms of social service are too costly and impracticable now. Before we accept these objections we should carefully weigh both the cost of maintaining the children for a long time in institutions and the difficulty of providing such institutions on anything like modern lines. There are many other disadvantages than obvious peril to the child's mind which follow the taking of children from their parents and are less easy to assess in money. Many feckless parents become still more irresponsible and continue to beget families which present an equal or greater problem.

(3) *Modifications of the Law Protecting Children.*—A step which should now be taken is to modify existing statutes for the protection of the young. These are based on the fact that a child needing care and protection must be removed from his natural family and placed in entirely different surroundings. The power to do this under section 52 of the Poor Law Act, 1930, and under section 61 of the Children and Young Persons Act, 1933, has been used to advantage, and it must be remembered that, if and when the home conditions are remedied, the process can be reversed. The present system has the merit that it gives control to, and vests parentage in, the authority for so long, up to 18 years of age, as is necessary to secure the desired end of the welfare of the children. If, now, prevention is to be given every opportunity of success, some change in the law and reorientation of the magistrates' outlook will be needed. For this purpose it is suggested that petty sessional courts should have power, on representation from a local authority, to order the parents to enter into a recognisance to exercise proper care and guardianship. Such a power already exists where a child or young person is shown to be in need of care and protection,[1] and, if extended, would be of great assistance in providing a way of placing the family on probation and under the legal guardianship of the health authority, both for types where the child is now removed from its parents and for other "problem" families which, it is hoped, authorities will take steps to ascertain. A system of family probation offers scope for immediate action and might in many cases be the means of avoiding the drastic courses of obtaining a "care and protection" order or adoption by public assistance authorities under section 52 of the Poor Law Act, 1930.

A further measure requires careful consideration—the removal of the family as a unit to care and protection in a controlled house where the teaching of family management could be undertaken by a trained social worker. If local authorities had such houses removal of the family as a unit to supervision might give surprisingly good results. The law would have to be amended to make this possible, as authorities could carry out such a step successfully only where an order of the court enabled them to enforce the removal. The existing scarcity of houses would be an immediate difficulty, as would the fact that such houses would be regarded as "homes of correction"; yet it might be justified by the great need to take all possible steps to assist local authorities to reconstitute the natural family home and so prevent homelessness. It would be used only in the last resort and is no more drastic than existing powers to remove children from their parents.

(4) *School Health Service, Delinquency, and Magistrates.*—Finally the delinquent who constitutes a small but appreciable proportion of homeless children needs to be considered from the same preventive angle. At present, when a child commits an offence against society, he may be sent to a child-guidance clinic, given to the care and protection of the education committee as a fit person, or committed to an approved school under the Home Office. Only when he is sent to a child-guidance clinic is there a chance that he will remain with his parents during the period when his mental condition is under review and treatment. It would be foolish to overestimate the power of the psychiatrist and psychologist to remedy psychological upsets; as, however, these for the most part have their origin in the child's relationship with his parents and in the relationship between the parents, it is logical to investigate each case from this angle. Investigation at the child-guidance clinic, with interrogation of parents and enlightenment of the teacher, should be a first step in all cases. Much information of the child's progress at school and at home is known to the school medical officer, and he should be able to enlarge on this where necessary by collating information from the family doctor, the poor-law doctor, the psychiatrist, and other sources, such as the hospital. It is strongly urged that the magistrates should obtain a report from the school medical officer before ordering removal of the child from its parents. There is little need to emphasise further the importance of all local education authorities now implementing the Education Act, 1944, by setting up adequate child-guidance machinery and completing the ascertainment of this form of handicap. Only with knowledge of the extent and number of such cases can prevention be exercised to the full.

SUMMARY

Analysis of the causes of children having been taken from their parents and placed in the care of the councils of three English counties reveals that a considerable

1. Children and Young Persons Act, 1933, section 62 (1) (c).

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proportion of such children come from families of the "problem" or "derelict" type.

Steps should be taken to reconstitute such families before the final stage of breakdown is reached. The time has come to make health authorities responsible for supervising "problem families" and to give them powers with which to carry out the work. Registration of "problem families" is advocated, with powers to effect rehabilitation of homes and to appoint special staff for teaching and supervision.

There is also a need to change the law and the present procedure of magistrates so as to assist in keeping families together against the increasing tendency to break them up. Placing the family on probation is most likely to be of practical value; removal of the family as a unit to care and protection, a more drastic step, might be a valuable power to give magistrates for use in extreme cases.

Delinquent children should not be taken from their parents without a report from the school medical officer and resort, wherever appropriate, to child-guidance.

The tables in this article were prepared for a subcommittee of the County Councils Association and, with some of the subject matter, formed part of a memorandum of evidence approved by the executive council of the association for submission to the Curtis Committee. The subcommittee consisted of Sir Joseph Lamb (chairman), Sir James Aitken, Sir Robert Doncaster, O.B.E., Sir Arthur Hobhouse, J. K. Hope (clerk of Durham C.C.), R. Beloe (director of education, Surrey C.C.), F. B. Matthews, M.B.E. (public assistance officer, Lindsey C.C.), and myself.

I wish to acknowledge my indebtedness to the County Councils Association for their permission to use for the purposes of this article certain information appearing in the memorandum. The views expressed in this article are, however, my personal views, and the association is not identified with them.

GENERAL MEDICAL COUNCIL

PROPOSALS FOR REFORM

THE annual report of the London and Counties Medical Protection Society, published this week, gives in full the proposals for reform of the General Medical Council which the society, jointly with the two other defence societies, is presenting to the council. These are:

1. (*a*) That the General Medical Council be empowered and required to establish two distinct and separate committees to be known as (i) the penal cases committee and (ii) the disciplinary tribunal; (*b*) that a member of the penal cases committee be not eligible to sit as a member of the disciplinary tribunal to hear a case that has already been before him as a member of the former committee; (*c*) that the disciplinary tribunal sitting with a legal assessor consist of 7 members drawn from a panel of 12 members elected by and from the council of the G.M.C., that its quorum consist of 5 members, and that it be vested with the full disciplinary and judicial powers of the G.M.C.

2. (*a*) That complaints received by the G.M.C. be examined in the first instance by the penal cases committee to determine whether a prima-facie case exists for reference to the disciplinary tribunal for determination; (*b*) that the G.M.C. be incompetent to present any case in which a Government department or a constituent body is the complainant and that the burden of the presentation of any complaint be undertaken only when the council is satisfied that justice would be denied in the absence of its intervention.

3. That the initial complaint in all cases, including information laid by a Government department, be supported by an affidavit or affidavits setting out all material facts.

4. That a copy of the affidavit or affidavits be furnished to the respondent with any request addressed to him to provide a reply and explanation.

5. That the respondent be given not less than four weeks' notice of any inquiry to be held by the disciplinary tribunal with discretionary power vesting in the president to extend the time on the receipt of an application to this effect.

6. That the attendance of witnesses and the production of documents before the disciplinary tribunal be enforceable by subpœna.

7. That all evidence before the disciplinary tribunal be given orally on oath save for good and sufficient reason except evidence as to character which may be given in writing.

8. That each party furnish to the other not later than ten days before the hearing of the case a list of the documents on which they propose to rely.

9. That notice to produce and admit be not permitted.

10. That the Evidence Act, 1938, be not made applicable to the proceedings of the disciplinary tribunal.

11. That the parties be entitled to require the disciplinary tribunal to subpœna any deponent to an affidavit to give oral evidence.

12. That only those documents which are agreed by the parties and such others as are proved in evidence be placed before the disciplinary tribunal.

13. (*a*) That a summing up by the legal assessor be not required unless it is requested by the disciplinary tribunal or one of the parties when in the opinion of that party a point of law is involved; (*b*) that if and when the legal assessor sums up, he be obliged to do so in the presence of the parties; (*c*) that the legal assessor be a barrister or a solicitor experienced in the practice of the Courts of Common Law and of not less than ten years' standing.

14. That provision be made for a right of appeal to the High Court by the respondent on points of law only.

15. That in the event of an appeal any order for erasure be suspended until after the hearing of the appeal, subject to the appeal being entered within seven days from the date of the order.

16. That the disciplinary tribunal be empowered (in addition to the present penalty of erasure) to administer other penalties short of erasure, viz., suspension for varying periods or censure of differing degrees.

17. That the disciplinary tribunal be empowered to award costs against a complainant or respondent and that machinery be established for taxing the costs.

18. That the G.M.C. be given the power, but not the exclusive power, to conduct prosecutions for infringements of the Medical Act, 1858.

19. That the words "professional misconduct" be substituted for the words "infamous conduct in a professional respect" and used in the same connexion.

20. That the rules of procedure relating to penal inquiries be not subject to the approval of a judicial authority.

21. (*a*) That the appropriate provision of the Medical Act be amended to permit of the imposition of a maximum penalty of £500 and the alternative of a term of imprisonment for persons convicted of falsely holding themselves out to be registered medical practitioners; (*b*) that addition be made to the present protected designations appearing in section 40 of the Medical Act to embrace abbreviations of recognised medical qualifications, the courtesy title of "Dr." when associated with the healing art, and any other description in common use that is accepted by the public and the profession as indicating that the user is a registered medical practitioner.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JUNE 8

Notifications.—Infectious disease: smallpox 3 (1 at Birkenhead, 2 at Liverpool); scarlet fever, 987; whooping-cough, 1749; diphtheria, 304; paratyphoid, 2; typhoid, 4; measles (excluding rubella), 3896; pneumonia (primary or influenzal), 546; cerebro-spinal fever, 47; poliomyelitis, 9; polio-encephalitis, 0; encephalitis lethargica, 2; dysentery, 149; puerperal pyrexia, 134; ophthalmia neonatorum, 60. No case of cholera or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 2 (0) from measles, 9 (0) from whooping-cough, 5 (2) from diphtheria, 49 (1) from diarrhœa and enteritis under two years, and 3 (1) from influenza.

The number of stillbirths notified during the week was 236 (corresponding to a rate of 29 per thousand total births), including 26 in London.

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THE WORLD'S FOOD

FROM OUR SPECIAL CORRESPONDENT

THE meetings of the Food and Agricultural Organisation of the United Nations in Washington from May 20 to 27 have resulted in the formation of an International Emergency Food Council of very wide scope. This new body has now been formally inaugurated with Mr. John Strachey, the Minister of Food, representing Great Britain.

The long preparation given to the proposals of the conference led to such a large measure of agreement between the representatives of the different nations that only minor divergences, such as on the size of committees, finally emerged. This preliminary work, which covered the whole world, was divided among three committees. Committee I was concerned with a survey of the world food situation as a whole. Their report on the food situation in 1946–47 was the first attempt made to forecast the state of the world's larder so far ahead as fifteen months. The committee's appraisal, based on reliable sources of information, made possible a rational approach to world food problems. There will be similar surveys at regular intervals as part of the information and intelligence service of the new International Emergency Food Council. The surveys will fill a big gap in the field of economic intelligence, though UNRRA, the Combined Food Board, the Combined Working Party (London), and the Emergency Economic Committee for Europe have published reports on various aspects of their work, and some governments have reported on countries other than their own.

The first world survey was prepared by a group of experts attached to the staff of F.A.O. and working in close collaboration with various governments which had the information at their disposal. Committee I pointed out that to run a world food information service successfully it is necessary to have current information cabled direct from workers in the field all over the world. The field information must then be analysed at F.A.O. headquarters. To attempt analysis at a lower level causes delay and prevents the information being up to date.

It is on the basis of the work of this committee that the world food information service of F.A.O. will be founded. While the world food emergency exists this service will keep the International Emergency Food Council supplied with the intelligence data required for its work.

FOOD OUTPUT

Committee II was concerned with the measures required to maintain or augment the world output of food in 1947 and 1948. The committee reported that, assuming "average" weather, 1947–48 would certainly be a lean year. Given this average weather there will probably be about the same quantities of food available for export from the exporting countries, and there is some prospect of an improvement in production in Europe and the East. But to set against this there will be a strong tendency to increase consumption in various countries, and, where circumstances appear to make it possible, to discontinue rationing. The committee consider that the world will need larger crops in 1947 than in 1948 in order (*a*) to close the gap which threatens to be as large in 1947–48 as in the previous year, and if possible raise nutritional levels; (*b*) to rebuild food stocks; and (*c*) to begin the replenishment of livestock.

For all of these reasons the committee foresee a continuance of shortage in 1947–48 and urge that every effort should be made to increase production, especially of cereals and foods of high calorie value. This means in effect a greater emphasis on the production of wheat and rice, but in some areas it means an increase in potatoes and sugar beet.

Decisions taken now on the supply of fertilisers, seeds, agricultural machinery, and cropping plans affect food-supply for consumption up to 1948. The committee report that as regards fertilisers the outlook for 1945–46 is better than it was last year when UNRRA, for instance, could get only 50% of its demands met in the countries in which it was operating. But much greater supplies are needed during the next few months, particularly of nitrogen; this means an increased output in Germany and Japan and the reopening of some nitrogen plants in the U.S.A. Many countries are still short of seeds, and in some countries seeds have been used for food. Agricultural machinery (particularly tractors) is also scarce.

Crop planning is probably quite as important as other factors—for example, the committee note the remarkably high proportion of crop land in north-western Europe and call for more wheat, potatoes, and sugar beet. But in crop planning the possibility of future surpluses is playing a part. Farmers in exporting countries fear that any present extension of wheat planting will lead to difficulty when the era of surpluses arrives. Also farmers in other countries are anxious to avoid reductions in livestock and there are problems in this connexion in Holland and Denmark. These fears can only be allayed by some form of long-term guarantee to farmers that their position will not be worsened. The committee do not say it, but it is clearly in the interest of all countries to overcome these difficulties; the penalty of failure is a continuance of the period of restriction and while that persists world recovery on a large scale is also restricted.

ADMINISTRATION

To committee III was confided the task of drawing up proposals for the future organisation of F.A.O., and it was from committee III that there came the proposals, which were adopted, to set up an International Emergency Food Council whose functions shall be:

"To consider, investigate, inquire into, and formulate plans with regard to any question in respect of which the member governments have, or may have, a common concern relating to the supply and distribution, in or to any part of the world, of foods, agricultural material from which foods are derived, and equipment and non-food materials ancillary to the production of such foods and agricultural materials, and to make recommendations to the member governments in respect of any such question."

These recommendations will deal with the international distribution of food, feeding-stuffs, and fertilisers, and "in principle" the entire food resources of the member governments will be "matters on which the fullest information will be interchanged." Here is international coöperation of a new kind. The work of the new council will include or take over the present functions of the Combined Food Board on which at present only the U.K., U.S.A., and Canada are represented. In future all the subscribing governments will be represented. As long as UNRRA exists—that is, up to the end of 1946 in Europe and to the spring of 1947 in the East—the closest coöperation will be maintained with UNRRA; its functions will be taken over when it ceases to have an independent existence.

The secretary of the Emergency Food Council is to be nominated by F.A.O., and the secretariat will as far as possible be chosen from F.A.O.

The representatives of governments present at the plenary conference on May 27, when the setting up of the International Emergency Food Council was agreed, took on themselves a solemn obligation. And they were men and women of ministerial or ambassadorial rank. They agreed (1) to give full coöperation for the purposes of the council, (2) to ensure the prompt supply of information regarding supplies and their dispatch and utilisation, and (3) to endeavour to implement all the recommendations which had been accepted, seeking special national action when necessary.

The F.A.O. is in future to report on its proceedings to the Economic and Social Council of the United Nations

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and it will enter into relations with the International Health Organisation which will be set up after meetings which are now taking place at Hunter College, in New York, the temporary H.Q. of the United Nations.

As soon as this week's meeting of the F.A.O. has validated the setting up of the International Emergency Food Council the organisation will come into existence. Then there will for the first time be a body of world authority, made up of representatives of governments supported by an expert secretariat, to confront the greatest food shortage which has ever faced mankind, and from that authority the world expects that help will come.

TO GUARD AGAINST FAMINE

A MEDICAL conference called by the health division of UNRRA at its European Regional Office on May 25 * made the following recommendations on how the victims of famine in a European community should be treated.

The treatment of starving patients requires an adequate supply of spray-dried skimmed-milk powder, dried eggs, prepared cereals, glucose (preferably fortified with vitamins), fats, fruit juices, and flavouring agents. Apart from the lack of calories, shortage of protein is likely to be the most serious consideration and every effort should therefore be made to increase supplies of protein-rich products such as prepared yeast, soya, dried liver powder, protein hydrolysate for administration by mouth, and dried slaughter-house plasma. Such products would be a useful supplement to the diet of the starving, and, in an emergency, could be used in partial substitution for dried milk and eggs. To hasten recovery, prevent relapses, and avoid overcrowding the hospitals, starving patients should receive a diet supplying at least 3000 calories daily. Hospitals dealing with severe cases of starvation should keep supplies of dried plasma for intravenous therapy, in normal or double concentration.

It is unlikely that there will be any serious incidence of florid vitamin-deficiency diseases (maize-eating communities excepted). In general, supplies of vitamins should be for oral use only and in amounts for prophylaxis rather than for treatment. The greater part of the vitamin requirements would best be met by the provision of natural, rather than synthetic, sources of vitamins —e.g., yeast or liver extract, fish-liver oils, and fruit juices.

If the supply of milk for children failed, rickets and vitamin-A deficiency would become a serious problem, so stocks of cod-liver oil should be on hand. Since the administration of a single large dose of vitamin D has great advantages in the prevention of rickets, adequate supplies of concentrated vitamin D in oil would be useful.

Sulphonamides would be needed for the treatment of diarrhœa and the intercurrent infections which are particularly liable to attack starving people. Penicillin would also be needed for intercurrent infections.

ADMINISTRATIVE MEASURES

In general, supplies of milk in post-war Europe have been sufficient at least to provide for the essential needs of young children; but there has been very little for adults and the older children. This, combined with the high phytic-acid content of the long-extraction bread grains at present in use throughout Europe, makes the diets of adults and older children particularly deficient in available calcium. Calcium carbonate should therefore be added to the bread. The general diet is also deficient in available iron, and in many parts of Europe anæmia is apparently prevalent. Efforts should therefore be made to provide additional iron, in medicinal doses, especially for pregnant women and those employed in factories. Facilities for communal feeding in factories, schools, and elsewhere should be used to the utmost, even if the factories and schools are closed.

Rationing systems in post-war Europe have on the whole provided fairly adequate rations for young children, but older children, who should be growing rapidly, have often had to subsist for long periods on insufficient diets. For this reason, older children and adolescents may require special consideration in a famine.

It is obviously desirable to maintain adequate food-supplies for children of all ages, but if a gross reduction in the official rations was inevitable it might become necessary to give first priority to workers in essential community services.

To lessen the effect of shortage of calories in the diet, every effort should be made to ensure sufficient heating in living and working quarters during the winter. In towns, the evacuation of non-essential population—children and non-working adults—to rural areas, or even to other countries, should be encouraged.

If famine developed in a European city the first people affected would probably be those living alone, the elderly, the occupants of institutions, and those without regular employment. It is important to provide "flying squads" to search out these people and bring them for treatment. Provision should also be made for special and regular medical inspections of orphanages, convents, old people's homes, mental hospitals, and gaols.

Next, ambulant cases of hunger œdema would begin to appear in increasing numbers, not serious enough to go to hospital, but requiring supervision and special treatment at clinics. A considerable increase in out-patient clinic facilities will be needed to deal with them, including "ambulatoria" attached to soup-kitchens and other places where people congregate. Large numbers of hospital cases need not be expected at the outset, but in the worst eventuality it may become necessary to provide extra hospital space in schools and elsewhere.

Doctors, nurses, health visitors, and others would be needed to staff these "flying squads," "ambulatoria," and inspecting teams. Consideration would have to be given to the best way of recruiting and equipping this emergency staff from the local population, UNRRA, military, and voluntary relief organisations.

PSYCHICAL SEIZURES

DR. WILDER PENFIELD'S ADDRESS

Dr. WILDER PENFIELD, F.R.S., director of the Neurological Institute, Montreal, delivered a lecture on psychical seizures at Oxford on June 14. He first described the mechanism of focal epileptic attacks; seizures result, he said, from intense spontaneous neural activity, "which may spread across the grey matter like a prairie fire." There is a powerful discharge from the cells involved until they are exhausted. The interictal stage, ictal exaltation, and postictal fatigue can be defined by the electroencephalogram. Clinical attacks should be classified according to the point of original discharge, which may be established either by the mode of onset or by the character of minor attacks. It is often said that attacks may start in a variety of ways in the same patient, but this is rarely so. During an attack the sensory and motor functions of the affected parts are completely paralysed; and postictal paralysis may be equally complete. Dr. Penfield quoted the case of a young woman subject to local discharges in Broca's area; during the attacks she was fully conscious and aware of her disability, which she sought to conceal by occupying herself with something that did not necessitate speech.

Psychomotor seizures may be classified as (1) visual, (2) sensory, (3) jacksonian, (4) conscious contraversive, (5) autonomic, (6) olfactory, (7) auditory, (8) vertiginous, (9) with illusion of perception, and (10) unconscious contraversive. Seizures originating in the temporal lobe may begin with silence, and be followed by turning to one side and an illusion of perception. The attack may stop here, or go on. Objects may seem to come closer or to recede; sounds may seem distant or unusually loud; or present experience may be interpreted as old. Usually there is a sense of remoteness, the patient feeling as if he were an onlooker. These attacks, which may end with convulsions, can be reproduced by electrical stimulation. They are the "dreamy state" described by Hughlings Jackson; but this term was used by him to include also hallucinations.

* Those present included: Dr. C. N. Leach, Prof. H. P. Himsworth, Mr. M. Pyke, PH.D., Dr. Janet Vaughan, Miss Harriette Chick, D.SC., Miss Margaret Hume, Dr. J. F. Loutit, Dr. I. A. Anderson, and Dr. D. A. Smith; for UNRRA, Dr. N. M. Goodman (Director of Health, European Regional Office), Dr. J. Cottrell, Dr. A. P. Meiklejohn, Dr. H. S. Collins, Dr. B. H. Smith, and Miss Jean Ritchie.

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With hallucinations, the localisation is in one or other of the temporal lobes. A vivid past experience, whose unreality is usually appreciated by the patient, may be recalled. The elements are largely visual or auditory; music may be heard, either as an elaborate symphony or as a simple melody; or words may be heard, and the excitation may spread to the uncinate gyrus with an illusory odour. Dr. Penfield mentioned as an example a young woman who in attacks heard spurious voices; recognising their unreality, she would ask actual speakers to talk louder. These attacks also can be produced by electrical stimulation; and the patient can contemplate and describe them. Rarely, they are preceded by a sense of compulsion to think or by unusual thoughts; thoughts may crowd into the mind or there may be a succession of thoughts. Even during this stage the sufferer may constitute himself an onlooker and try to recanalise his thoughts. In attacks there is sometimes stereotyped behaviour; a contraversive seizure and subsequent confusion may be preceded by the patient's clutching at his throat and tearing at his clothes; other patients have smashed their fist or head against a wall, or swung their arms round and round.

Confusion, automatism, and amnesia may be either ictal or postictal. Automatism is a common postictal phenomenon; here the attacks are most often localised to the region of the sylvian fissure. Typically, the patient, after a masticatory attack, tries to wander, but is violent only if opposed; and at the end of the attack he comes round suddenly. Dr. Penfield described the case of a young woman who, in an attack, felt that she was far off, or that other people were far off; this was an illusion of visual perception. In attacks she usually talked to herself and told herself not to have an attack; she felt that she was a spectator, but recognised that it was she who was having the attack. It might stop there or proceed to a sense of panic, in which she felt insecure. This symptom was followed by a sensation round the umbilicus and nausea. Her parents said that in an attack she would first smack her lips and say she was nauseated, then grip her abdomen. She would retire to the lavatory, but did not defæcate. During the attack there was audible abdominal rumbling, and as it ended she would belch. This, said Dr. Penfield, was ictal, and probably postictal automatism, dating from an attack of cerebral malaria in childhood.

Ictal automatism is commonest in idiopathic epilepsy, and is often referred to as petit mal; the paralytic effect may be continued into the period of postictal fatigue. Finally, after a series of seizures in status epilepticus, there may be protracted mental symptoms, such as negativism, which are attributable to continued frontal-lobe disturbance which is neither ictal nor truly postictal.

BIRTHDAY HONOURS

THE honours list issued on June 13 contains the following names of members of the medical profession:

Baron

Sir AMBROSE WOODALL, M.D., M.SC. Manc., F.R.C.S.
Senior surgeon, Manor House Hospital, Golders Green; for political and public services.

K.C.S.I.

Major-General GORDON WILSON, C.B., C.B.E., M.C., M.B. Edin., K.H.S., British Service, late R.A.M.C.
Director, Medical Services in India.

K.C.M.G.

PETER HENRY BUCK, D.S.O., M.D., D.SC. N.Z.
Director of Bernice P. Bishop Museum, Honolulu; professor of anthropology, Yale University; for services to science and literature.

K.B.E. (Military)

Major-General ALEXANDER GORDON BIGGAM, C.B., O.B.E., M.D. Edin., F.R.C.P., K.H.P.
Consulting physician to the Army.

Brigadier HUGH WILLIAM BELL CAIRNS, D.M. Oxfd, M.B. Adelaide, F.R.C.S.
Nuffield professor of surgery, University of Oxford; consulting neurosurgeon to Army at Home.

Air Vice-Marshal JOHN JOSIAS CONYBEARE, M.C., D.M. Oxfd, F.R.C.P.
Physician to Guy's Hospital, London.

Air Marshal ANDREW GRANT, C.B., O.B.E., M.B. Edin.
Director-general of medical services, Royal Air Force.

Surgeon Rear-Admiral CECIL PEMBREY GREY WAKELEY, C.B., D.SC. Lond., F.R.C.S., F.A.C.S., F.R.A.C.S.
Senior surgeon, King's College Hospital, London.

K.B.E. (Civil)

HARRY CHAPMAN SINDERSON, C.M.G., C.V.O., O.B.E., M.D. Edin.
Dean, Royal Faculty of Medicine, Bagdad.

Knights Bachelor

Major-General GORDON COVELL, C.I.E., M.D. Lond., K.H.P., I.M.S.
Director, Malaria Institute of India, Delhi.

ANDREW DAVIDSON, M.D. Glasg., K.H.P.
Chief medical officer, Department of Health for Scotland.

PHILIP NOEL PANTON, M.B. Camb.
Consultant adviser in pathology, Ministry of Health; clinical pathologist and director of bacteriological, biochemical, and clinical laboratories, London Hospital.

LEONARD GREGORY PARSONS, M.D. Lond., F.R.C.P., F.R.C.O.G.
Professor of diseases of children and dean of the faculty of medicine, University of Birmingham.

C.B. (Military)

Major-General NEIL CANTLIE, M.C., M.B. Aberd., F.R.C.S., K.H.P., late R.A.M.C.

Surgeon Vice-Admiral HENRY ST. CLAIR COLSON, C.B.E., M.B. Lond.
Medical director-general of the Navy.

Major-General JOHN CECIL ALEXANDER DOWSE, C.B.E., M.C., M.B. Dubl., late R.A.M.C.

Major-General DAVID VINCENT O'MALLEY, O.B.E., M.B. N.U.I., V.H.S., I.M.S.

Air Vice-Marshal ARTHUR EDWARD PANTER, B.A. Camb., M.R.C.S., K.H.S.

C.S.I.

Major-General JOHN PATRICK HUBAN, O.B.E., M.B. N.U.I., K.H.S., I.M.S.
Surgeon-general with the Government of Madras.

C.I.E.

Colonel NORMAN BRIGGS, M.R.C.S., I.M.S.
Inspector-general of civil hospitals, United Provinces.

Lieut.-Colonel GURDIAL SINGH GILL, O.B.E., M.B. Edin., I.M.S.
Inspector-general of prisons, Madras.

Lieut.-Colonel DAYA RAM THAPAR, O.B.E., M.B. Edin., I.M.S./I.A.M.S.
Commandant, I.A.M.C. headquarters, Poona.

C.B.E. (Military)

Air-Commodore E. D. D. DICKSON, M.B. Edin., F.R.C.S.E.

Surgeon Rear-Admiral C. V. GRIFFITHS, C.B., D.S.O., M.R.C.S., K.H.P.

Air-Commodore P. C. LIVINGSTON, O.B.E., A.F.C., F.R.C.S.

Brigadier J. R. REES, M.D. Camb., F.R.C.P.
Director, Tavistock Clinic, London; consulting psychiatrist to the Army 1939–45.

Colonel O. L. SHEARER, L.R.C.P.E., South African Medical Corps.

C.B.E. (Civil)

ROBERT BENEDICT BOURDILLON, M.C., A.F.C., D.M. Oxfd.
Director, M.R.C. electromedical research unit, Stoke Mandeville Hospital, Bucks.

LEONARD WYNNE EVANS, B.SC. Wales, M.R.C.S.
C.M.O., Penang; for services before and during the Japanese occupation.

JAMES FERGUSON, M.B. R.U.I.
Lately M.O.H. for Surrey.

WILLIAM KELSEY FRY, M.C., M.R.C.S., L.D.S.
Dental surgeon, Guy's Hospital, London; civil consultant in dental surgery, R.A.F.; consultant on jaw injuries, Ministry of Health.

Lieut.-Colonel HILDA M. LAZARUS, M.B. Madras, F.R.C.S.E.
C.M.O., Women's Medical Service, and asst. director-general, I.M.S. (women's branch).

OSBORNE HENRY MAVOR (JAMES BRIDIE), M.D. Glasg.
Playwright; chairman, Scottish committee of the Arts Council.

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TOM LAKIN PAGET, M.R.C.S.
Formerly director of maternal welfare, health dept., New Zealand.
HENRY RICHARD RISHWORTH, O.B.E., F.R.C.S.
Principal medical and health officer, Great Indian Peninsular Railway, Bombay.
DOUGLAS JAMES VALENTINE, M.C., M.B. Lond.
Lately D.D.M.S., Hong-Kong; for services during internment.

O.B.E. (Military)

Wing-Commander FENTON BRAITHWAITE, M.B. Camb., F.R.C.S., R.A.F.
Colonel G. W. S. FOSTER, M.B.C.S., R.A.M.C.
Lieut.-Colonel H. K. GROFF, M.D. Manitoba, R.C.A.M.C.
Colonel H. P. HAMILTON, M.D. Toronto, R.C.A.M.C.
Lieut.-Colonel C. H. HOSKYN, M.B. Camb., R.A.M.C.
Lieut.-Colonel NOWSHIR JUNGALWALLA, M.R.C.P., I.A.M.C.
Surgeon Captain GEORGE MCCOULL, M.D. Durh., R.N.V.R.
Colonel R. H. MCGIBBON, M.D. McGill, R.C.A.M.C.
Lieut.-Colonel J. C. PATERSON, M.D. Toronto, R.C.A.M.C.
Surgeon Commander ARNOLD PERRY, R.N.Z.N.V.R.
Group-Captain P. B. L. POTTER, M.D., R.A.F.
Colonel R. W. RAVEN, F.R.C.S., R.A.M.C.
Lieut.-Colonel A. M. ROBERTSON, M.B. Glasg., R.A.M.C.
Surgeon Commander E. G. THOMAS, M.D. Lond., M.R.C.P., R.N.V.R.
Surgeon Lieut.-Commander D. A. THOMSON, M.B. Glasg., R.N.V.R.
Colonel L. E. VINE, M.B. Lond., F.R.C.S.E., R.A.M.C., Malayan Medical Service
Surgeon Commander W. K. WELSH, M.D. Toronto, R.C.N.(R.).

O.B.E. (Civil)

RATNAM APARAJOO, L.M.S.S.A.
For services as surgeon at Penang during the Japanese occupation.
Miss LAI PO CHUEN, M.B.
Lately M.O., Hong-Kong; for services during the Japanese occupation.
KENNETH HENRY DYKE, M.B. Glasg.
D.M.S., Basutoland.
HAROLD FAIRBAIRN, M.D. Glasg., Colonial Medical Service.
Sleeping-sickness officer, Tanganyika Territory.
Captain A. D. ILIFF, M.R.C.S., I.M.S.
Agency surgeon, South Waziristan, North-West Frontier Province.
Major MUHAMMAD JAFAR, M.B. Punjab, I.M.S.
Director of public health, Bengal.
BURJOR FRAMJI KHAMBATTA, M.B.E., M.B. Bombay.
Port health officer, Karachi.
Miss MARJORIE J. LYON, M.B. Sydney, F.R.C.S.E., Colonial Medical Service.
M.O., Malaya; for services during evacuation and internment.
GOPAL DASS MADHOK, L.R.C.P.E.
Medical practitioner, Jaffirband, Hailakandi, Cachar, Assam.
Major J. D. MURDOCH, M.B. N.Z., F.R.C.S.E., I.M.S.
Professor of obstetrics and gynæcology, Prince of Wales Medical College, Patna, Bihar.
ISAAC LADIPO OLUWOLE, M.B. Glasg.
M.O.H., Lagos.
Rao Bahadur KIZHAKKE COVILAGAM KUTTY ETTAN RAJA, L.R.C.P.E.
Secretary, Health Survey and Development Committee, and lately asst. public-health commissioner with the Government of India.
WALTER SNEDDON ROBERTSON, M.B.
Orthopædic surgeon, Wellington Public Hospital, New Zealand.
JAMES PATRICK TAYLOR, M.B.
P.M.O., British North Borneo (Chartered) Company; for services during the Japanese occupation.
ROBERT SCOTT TAYLOR, M.B. Glasg.
M.O.H., Zanzibar.
Major G. B. THOMAS, M.B. Sheff., F.R.C.S.E., I.M.S.
Superintendent, Government Hospital for Women and Children; professor of midwifery, Medical College, Madras.
GEORGE HAROLD TAM THOMAS, M.B.E., M.D. Hong-Kong.
M.O., medical dept., Hong-Kong; for services during enemy occupation.
ARTHUR STEWART WESTMORLAND, M.R.C.S., Colonial Medical Service.
Senior M.O., Kingston Public Hospital, Jamaica.
ALFRED ERNEST YOUNG, M.R.C.S.
M.O., Basutoland.

M.B.E. (Military)

Major I. A. ANDERSON, M.B. Aberd., R.A.M.C.
Captain R. W. BIAGI, M.B. Edin., R.A.M.C.
Surgeon Lieutenant A. K. BROWN, M.B. Glasg., R.N.V.R.
Major D. L. GRIFFITHS, M.B. Manc., F.R.C.S., R.A.M.C.
Captain MOTI LAL, I.A.M.C.
Major GUY LATOUR, M.D. Toronto, R.C.A.M.C.
Major D. G. MCCONNELL, M.B. Edin., R.A.M.C.
Major A. R. MCPHERSON, M.D. Manitoba, R.C.A.M.C.
Captain C. P. NAIR, I.A.M.C.
Major E. H. R. SMITHARD, M.D. Lond., R.A.M.C.
Surgeon Captain J. W. THOMSON, M.B. Glasg.
M.O., British Guiana battalion.
Captain H. C. TUGNAIT, I.A.M.C.
Major W. C. WALTERS, R.A.M.C.
Captain R. I. WILLIAMS, M.R.C.S., R.A.M.C.

M.B.E. (Civil)

RANGACHARI PADMANATHA CHARI, F.R.C.S.E.
Civil surgeon, Jubbulpore, Central Provinces and Berar.
ALEXANDER FRANCIS RITCHIE CRAWFORD, M.B.
Medical practitioner, Invercargill, New Zealand.
Sardar Sahib RAJINDER SINGH GREWAL.
Civil surgeon, Burma.
Khan Bahadur ABDUL HAMID, M.B. Allahabad.
Asst. director of public health, United Provinces.
Major K. L. JETLEY, I.M.S. retd.
M.O. i/c Sikh regimental centre.
Rai Bahadur JIRWAN LAL, M.D. Punjab.
Lately professor, King Edward Medical College, Lahore.
Major W. H. MYBURGH, M.R.C.S.
South African Medical Corps.
Rai Bahadur BIHARI SEN ROY.
Deputy inspector-general of civil hospitals, United Provinces.
AMRATRAL UJAMSEE SHETH, M.B.
For public services in Kenya.

HOME HELPS

THE Government's decision to set up a National Institute of Houseworkers will probably result in time in a good supply of home helps and domestic helps for the local-authority services. In the meantime many services of the kind are merely a hope of things to come, rather than a living body of women able to clean a house and feed a family. The Minister of Health has set himself (in circular 110/46) to woo home helps from their lairs, and has had several schemes investigated in the hope of finding the secret of success. In two of the most promising schemes those responsible give their whole time to it under the leadership of a resourceful and enthusiastic organiser. The work is done in a separately housed section of the public-health department, and the administrative staff, householders, and helpers all keep in close personal touch. This makes it possible to fit the helper to the home and vice versa. When helpers are recruited they are told that they are members of the local-authority staff, and wages, hours, and conditions of work are clearly specified. The wages are roughly what they would earn in a factory or comparable employment in the district.

Some authorities have delegated the work to the Women's Voluntary Services, and in many places these organisations would be willing to run schemes if the authorities asked them, and gave them the necessary offices and clerical help. If the scheme is large enough to justify it the Minister will agree to the appointment of a full-time paid organiser, whether it is being run by the W.V.S. or not. The efforts of the employment exchanges to get recruits must be supplemented by a personal approach, and the organiser should explain the needs at meetings of women's organisations where recruits may be found—for example, at mothers' meetings, church clubs, and the Women's Coöperative Guild. Rates of pay, besides being equal to those in other work in the neighbourhood, must take account of the worker's need to provide her own food. A metropolitan borough pays 1*s.* 9½*d.* an hour, and in a provincial city the rate is 1*s.* 6*d.* an hour. It may also be well to pay a retaining fee of 5*s.* a week to workers not continuously employed.

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In England Now

A Running Commentary by Peripatetic Correspondents

EVEN the least obviously utilitarian habits of the lowliest arachnids work a profound purpose and provide for some deep-felt want of the organism. May not the same hold true for the queueing habits of *H. sapiens* which your correspondent of June 8 has observed?

As a place of absolute relaxation and freedom from mental and physical conflict, the well-ordered queue has no parallel. There is no opportunity for initiative—the queuer must wait upon the movements of those ahead. There is no opportunity for the pursuit of useful and improving exercises, for the jostling of fellow queuers and the constant slow shuffling make concentration impossible. Therefore the man in the queue is able, for a brief space, to be utterly and happily idle, and this without the smallest twinge of conscience. Small wonder, then, if, between a lecture on the Siphonaptera and a microscopical demonstration of their unlovely shapes, we sought respite in the blessed blankness of the queue. It was no slavish habit that lined us up, but a need to recuperate from the painful ecstasy of one stirring session before plunging headlong into the emotional turmoil of the next.

So, also, has England learned to queue. Weaker and costlier beer, American films like *Mrs. Miniver*, daily intelligence of the sordid feats of politicians—all these and more have made the last years horrible, but always the queue has sustained us. You, Sir, have noticed the empty apathetic faces stretching out in pairs from bus-stops, tobacconists, and hokey-pokey stalls. Possibly you, with your correspondent, have felt an irritation at the display of what you felt to be so much sheepishness, but in such case, Sir, you and your correspondent were wrong. The face was dull because the body was at rest, and the eyes, twin windows of the soul, were empty because the soul had fled its habitat, soaring to rare and lovely heights of fancy. Aye! The queue's the thing wherein I'll catch the visions of a king.

* * *

And Again.—Your entomological peripatetic bemoaning the apparent meekness and idleness of his queueing D.T.M. and H. class has, I think, been misled. Perhaps by microscopist's myopia, perhaps by ocellar opacity; for had he got us properly into focus he would have observed nothing "dismal, mechanical, or inevitable" about our stance. Most of us have acquired this habit of deliberate, purposeful, and pleasurable resting in line astern in prisoner-of-war camps; the others are just natural devotees of W. H. Davies's sound philosophy

> A poor life this if, full of care
> We have no time to stand and stare.

Why hurry? Most specimens were less mobile than we and the dead diptera, even more dehydrated, shrivelled, and brittle. Why rush to admire the elaborate mouth-parts of the mosquito when we were well aware that the most toothless of us could and did effectively despatch the refectory lunch in less than ten minutes? Besides, a little rest, albeit vertical, after a bewildering lecture and a very hot but watery and expensive cup of elevenses coffee was as necessary as it was welcome.

After five years of Army medicine, mostly abroad, we found we had lost the art of diligent study and ostentatious laboratory activity even before the most watchful of internal examiners. We were certainly not apathetic or disinterested. Far from it; that D.T.M. and H. was to be our passport back to the tropics so eagerly desired after a few months of post-war England.

No, we simply could not be rushed. And anyway, who could afford or would have cared to forgo the good stories, bartered reminiscences, and forecast examination questions that passed in that laboratory queue? Last week's results have shown that, granted a little good will and forbearance by the examiners, the medical ex-Service man's reduced rate of application and absorption can still bring in the desired dividends.

* * *

Relief workers in Europe after the last war have prepared those doing it now not to expect gratitude. None the less, it was rather a shock to be told of the latest Viennese mot—"wenig, nichts, UNRRA"—considering that UNRRA has supplied 78% of all rationed food in Austria during April and May: and everything is rationed except pickled gherkins. This attitude is partly due to an adroit passing of the baby by the armies for UNRRA to hold just when its food was obviously running short; partly to an unfortunate announcement of the B.B.C. linking a reduction in rations with the taking over of responsibility for supplies in Austria by UNRRA; partly to a characteristically Viennese incapacity to refrain from a joke even against their own interests; and partly to the historical development of an "occupation" technique which consists in doing nothing and complaining "You got us into this mess: now get us out of it!"

Coming from a nation which fought us with no greater unwillingness than they fight anybody, which had a higher proportion of members of the Nazi party even than Germany, and which, I sadly agree, seems to be doing less to help itself than any other "liberated" country, it is a bit steep. If Bond Street was blocked with debris at one point, as the Kärntnerstrasse is, I think we would unblock it with our bare hands even in the absence of trucks and bull-dozers. The uncleared debris is bad—and ruined rococo looks much more ruinous than ruined 20th century—but Vienna is not in nearly such a bad state as most German towns, let alone Warsaw, and no town in Europe except Naples has less excuse for what it has not done.

Still, it is difficult to blame people on a diet of less than half our own, and, when all's said, Vienna keeps its indefinable charm, and its girls are still the prettiest in Europe. To look out of one's window in Sacher's hotel on to the ruined Opera and the battered Hofburg and listen to a Russian band and the clop-clop of the horse-drawn cabs is to evoke to the full that atmosphere of Strauss-and-decay which is the essence of Vienna today. Let us hope that "Operation Henpeck," now in full swing among the garrison, will not overlay it too strongly with British matrons. Turning in, one reads that "Miss Austria of 1938" has been arrested for black-market dealings in insulin.

* * *

The book I bought last week, *Operation Neptune*, has revealed that my only claim to martial fame has been missed. I could have been the first medical officer in the Allied fleets to sight the coast of France. But alas I was having a disillusioned gin in the wardroom. It was the evening before D-day, and the captain dramatically pointed out ahead the dark shadow of the enemy land. All the ship's company gazed with excitement and trepidation, speculating according to their natures on what lay ahead. The first view was to be a memory for the rest of our lives. We were disappointed. The enemy coast started to rise and eventually ascended as an undoubted cloud. So the next announcement found me unmoved and thus I lost my only chance of fame.

* * *

Peripatetic neuropsychiatrists should verify their facts before they project their unconscious conflicts on to the authors of textbooks. *Recent Advances in Neurology and Neuropsychiatry* is not an annual, nor is it official, and if the outraged psychiatrist of June 15 had troubled to read as much as the preface he would have discovered that its authors are on his side. They expressly point out that they do not identify neuropsychiatry with psychiatry. There are, they say, "vast fields of mental functioning to which neurological concepts are quite inapplicable and which can only be described in psychological terms," and neuropsychiatry "does not imply the existence of neuropsychiatrists as a kind of hybrid specialist. There is still room for neurologists, psychiatrists and psychotherapists, but all should be neuropsychiatrists"—that is, they should be trained in those disorders where the psychological and the neurological overlap. The animal in the French proverb was wicked enough to defend itself when attacked, but what is one to do with an animal which attacks its defenders?

* * *

Our Belgian colleague still has some difficulties with the English language. He appears to like his women Rubensesque, and therefore complains that "the English women have too few breasts." I am reminded of a very courageous lady who remarked when recovering from her second operation for cancer of the breast that she was thankful she was not a rat.

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Letters to the Editor

CHAIRS AT TEACHING HOSPITALS

SIR,—The subcommittee on medicine of the University of London has recommended that "chairs in special subjects should be held in postgraduate institutions rather than in undergraduate medical schools," and, on the strength of this, one school has been prevented from setting up a chair in child health. Is this just?

There are two forms of specialisms. There are those which are developments of medicine and surgery into very narrow spheres, like neurosurgery. These are matters for postgraduate study and teaching. But there are also those that are a part of general medicine; that care for all men and women at some time in their lives; that deal with conditions providing excellent illustrations of certain general principles; and in which every case means a social as well as a personal complication. Take my own subject. All men at some time suffer from an acute affection of the upper respiratory tract. The throat and ear afford the best material for teaching the principles of infection and inflammation, while every case that develops earache touches on the great social problem of chronic ear disease not only in its mortality but also in regard to a morbidity that affects the education of the young and the wage-earning capacity of the adult. Similar claims may be made by those who specialise in eyes, skins, orthopædics, or in diseases that are special to children. These are the departments that we need in the undergraduate schools. Are they to continue only under "recognised teachers" or to rise to the status of a readership, without ever being allowed to be worthy of a professorship?

Men's minds today are turning to posts rather than to practices for their life's work. Are the undergraduate hospitals to be deprived of the highest spurs to ambition for many of their staff? Can they afford to find the majority doomed to second rank status except by emigration? Can London University itself afford to bind itself by rules such as this? I think not. It is only by the widest elasticity that it can enter on that great expansion which the Barlow Committee on scientific man-power demands of us.

Guy's Hospital, London, S.E.1. T. B. LAYTON.

TUBERCULOSIS AND SANATORIUM TREATMENT

SIR,—I sincerely hope that "Bellefield" will modify his contention in your last issue that we sanatorium superintendents on the whole lack common sense, when he finds, as find he must, our wholehearted agreement with so much of what he says. In his last paragraph he pleads, in effect, for (1) greater enlightenment of the general public concerning tuberculosis, (2) more (comfortable) sanatoria, and (3) night sanatoria, such as already obtain in U.S.S.R. Will he not be pleased to learn that these are but three of many projects upon which the whole "world of tuberculosis" has been devoting considerable energy for years?

How much of the discomfort he describes was subjective and how much objective? No-one can say. From his viewpoint he was treated at a sanatorium where conditions were too rigorous and thus defeated their own end. On the other hand, he may possibly be one of the few unfortunate patients who cannot stand climatic conditions which many of his fellow-patients find stimulating, enjoyable, and curative. Ten men's mackerel may be another man's antigen.

No sanatorium physician, I am sure, would wittingly allow a patient to spend his rest-hours "chilled to the bone" when comfort can so easily be restored by additional blankets and hot-water bottles. Is it possible that "Bellefield" suffered in silence, I wonder? A big, and I might add, a most unusual mistake, although I admit that it is occasionally made. Cold dry fresh air, it will generally be conceded, is beneficial only because in some unaccountable manner it "braces" the patient and increases his appetite; and it also promotes deeper and more refreshing sleep. If it fails to bring about these metabolic desiderata there is no virtue in it. There is no evidence that it has any direct curative action on the diseased lung tissue; and a chronic bronchitic, with or without tuberculosis, is better with his windows shut during a fog. Contrary to "Bellefield's" observation, however, one's experience is that patients—and staff—who show a marked enthusiasm for fresh air are far less prone to acute catarrhal infections (which I take as being meant by his term "chill") than are the "frowsters."

Finally, when he states that the treatment of the tuberculous patient necessitates only slight modification of home conditions he is challenging two cardinal features of sanatorium treatment which we superintendents maintain to be of more importance even than our mountain air or sea-breezes. They are: first, the patient finds it very much easier to observe the strict rules of rest and prescribed exercise in a community which is observing the same regime than it would be to carry out the treatment in his own home; second, on entering a sanatorium the patient is removed from the circumstances which contributed towards—or even precipitated—his breakdown, be they ill-nourishment, bad housing, bad working conditions, or the no less malignant psychological circumstance of an unhappy or frustrating environment. There is a certain wild logic about treating a near-drowned child on dry land, even though at a later date one may put him back into open water and help him discover his limitations as a swimmer so that he is less likely to make the same mistake again.

The Mundesley Sanatorium. GEORGE DAY.

ARTIFICIAL PNEUMOPERITONEUM

SIR,—Dr. Simmonds, in his article of April 13, deals with the complications of artificial pneumoperitoneum.

Until one can assess the value of artificial pneumoperitoneum in the treatment of a large number of cases, I admit it does not seem justifiable to offer criticism. Dr. Simmonds's article, however, does leave the impression that a pneumoperitoneum can be undertaken with impunity. Under the heading "puncture of viscera," he says, "it is probable that viscera are wounded more often than is recognised" and that "with care in technique the accident is surprisingly rare." Is there, in actual fact, any technique about the procedure at all—one pushes a needle through the peritoneum, lets in air, and hopes for the best. Anyway, the two statements are not consistent: if viscera are probably wounded more often than is recognised can one say the accident is surprisingly rare?

When I was working in a sanatorium of 1100 beds in Milan in 1932, pneumoperitoneum treatment was being undertaken in a number of cases, but I gathered that the results were, on the whole, considered somewhat disappointing.

There is, at the present time, a tendency to think one must undertake some form of active treatment for every case of pulmonary tuberculosis, and although it is readily admitted that some cases do derive benefit from pneumoperitoneum, it would be a pity if the treatment became epidemic. In artificial pneumothorax if one "observes the rules," one should avoid air embolism, unless one is unfortunate. In pneumoperitoneum there are no rules and any case may develop an embolus. I think this fact needs bearing in mind by those—apparently not a few—who advocate induction of pneumoperitoneum on every case unsuitable for any other form of active treatment.

Tuberculosis Dispensary, Maidstone. H. J. ROBINSON.

RELATION OF THE ADRENAL CORTEX TO ARTHRITIS

SIR,—It is hardly surprising that none of Dr. Harrison's five rats treated with desoxycorticosterone acetate (D.C.A.) developed arthritis (June 1, p. 815). Unlike the cardiovascular and renal lesions, arthritis is an inconstant manifestation of D.C.A. overdosage. This was emphasised in all pertinent papers of the Montreal group and has been confirmed by Dr. Harrison's painstaking statistical study of our findings.

Dr. Harrison's own data do not lend themselves particularly well to statistical analysis. He used only 10 rats (weight? age? route of D.C.A. administration?), and these were subdivided into four groups receiving different treatments for various lengths of time. Possibly the diet described as "cabbage or carrot, bread and rat cake" did not contain enough protein. (For data on dietary factors influencing D.C.A. overdosage, as well as for a general summary of the pertinent literature, see my monograph in the *Journal of Clinical Endocrinology*, February, 1946.) HANS SELYE.

Institut de Médecine et de Chirurgie Expérimentales, Université de Montréal.

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RESEARCH IN STOMATOLOGY

SIR,—Your leading article of Feb. 16 on the Teviot report demonstrated once again the sympathetic anxiety which THE LANCET has shown—constantly over the past century—that the care of the teeth should enter more closely within the broad fold of medicine. I should like also to pay tribute to Major-General Helliwell for adhering to his convictions and recording his own minority opinion in the report.

My present purpose is to plead for the establishing of facilities for research in a much broader sphere than has been possible hitherto in the dental field alone. I hope that those who have control under the new Health Bill may see the value of establishing, in the medical faculty of one of our universities, either an institute of stomatology or else a department in this subject in connexion with the study of infants and children. What I mean by stomatology is an integrated study of the development and subsequent reactions of those parts which arise from—or in relation to—the primitive stomadeum, including, of course, the teeth.

Requisite as high skill in the dental craft undoubtedly is for meeting the everyday requirements of the population, it will not be through the craft but through the study of predisposing causes and incipience that ultimate prevention of irregularities and diseases of the teeth and jaws will materialise. We must therefore foster research in fields beyond that of the teeth alone and earlier than children ordinarily come under dental observation. We must go to the prenatal era and see what ætiological factors lie here; to birth and see how the mechanics of parturition leave their impress on the jaws; to nutrition and observe its effect on the structure and eruption of the teeth; and to infantile diseases, like the exanthemata, and see their effect on the growth of the accessory sinuses and consequent mal-development of the jaws; and we must refer constantly to genetics, to comparative anatomy and physiology, to physical anthropology and biometry, and integrate our findings in these allied fields.

Pædiatric stomatology, as one might term it, is the obvious starting-point for this research and the proper springboard for a biological approach to dental problems of adolescence and adult-age.

London, W.1. C. BOWDLER HENRY.

P.S.—I have been taken to task in discussions for introducing the word stomatology. My use of the word is but a reintroduction. The old International Congresses of Medicine, the last of which was held in London in 1912, contained a section under this title.

CIVILIAN QUALIFICATIONS IN THE SERVICES

SIR,—It is increasingly apparent to those who are privileged to try to assist ex-Service men and women seeking employment in the ancillary medical services that something must be done to persuade the Services to alter their ways. At present the Services train dispensers, radiographers, masseuses, &c., up to a Service standard. They pass an examination, the standard of which is set by the individual Service. There is no doubt but that they are very competent, but when they come to seek civilian employment they are regarded as unqualified in their particular trade or calling in view of the fact that they have not obtained the recognised civilian diploma or qualification. There are many such tragedies today and these tragedies are all the more apparent amongst the "Regulars" than amongst those who have served but temporarily.

It would be quite easy for the Services to urge, and in fact insist, that their dispensers, masseuses, radiographers, &c., should sit for the recognised civilian examination and obtain the recognised qualification or diploma. It would be equally easy for Service hospitals to become recognised training schools for nurses and to ensure that nursing orderlies can become State-registered nurses. There is a grave shortage of nurses but there is not such a shortage of people willing to do nursing and with many years' practical experience in nursing in the Services.

Early in 1941, whilst in the Services myself, I urged that the Royal Air Force should train its male and female nursing orderlies up to S.R.N. standard and should give commissions in its nursing service to those who obtained State registration and were suitable. The reply I received was that my recommendations were "premature." The Services have, from the point of view of State-registered nurses, continued to lead a parasitic existence and obtain all their qualified nurses from civilian sources. It is surely in the interests not only of the individuals but of the Services and of the nation that the Services should train their men and women to a standard nationally recognised so that the individual leaving the Services can stand on his own feet in the civilian field.

Dorking. RICHARD W. DURAND.

G.M.C. ELECTION

SIR,—Ballot papers were dispatched to the undersigned for the election of five members to the G.M.C. on May 28. We were surprised to note the necessity for recording these votes before June 5 and that we were disenfranchised in consequence, presumably in common with most doctors in the Services overseas.

In view of likely developments in the organisation of medical practice, we feel that such elections as these concern us to a greater extent than previously, and that the lack of foresight or knowledge of circumstances shown in this case is most unfortunate. We suggest that there are no insurmountable difficulties involved in circularising the profession at such an early date that everyone may record an opinion and hence secure true representation.

L. F. MILLER.
Singapore. GORDON SUTCLIFFE.

SUPPLIES OF STREPTOMYCIN

SIR,—In your issue of April 13 (p. 557) you published a letter from me on the refusal of Washington to allow supplies of streptomycin to be exported to this country. Later (April 27, p. 629) Dr. Wrigley quoted a report in the *Pharmaceutical Journal* that streptomycin could be obtained by application to the National Research Council, Washington, D.C. It may save others trouble to know that I duly made application and have learnt that no streptomycin is available for export from the United States. I am informed that, since supplies of the drug are extremely small and a very limited amount of material is available for a programme of clinical testing, this is being confined to a number of clinics and hospitals within the United States. For the present, therefore, we must remain dependent for our knowledge of this drug upon the American journals and our own newspapers and must await the production of streptomycin in the United Kingdom. R. GRENVILLE-MATHERS.

Penmaenmawr, Caernarvonshire.

TREATMENT OF ACUTE OSTEOMYELITIS

SIR,—In their article of June 15 Dr. Agerholm and Dr. Trueta refer to a previous series of 40 cases reported by Mr. I. W. J. McAdam [1] and recall his statement that in 10 of his patients infection had spread to a neighbouring joint. They add ". . . since this complication is serious and disabling any form of treatment which permits such a high incidence as 25% is of doubtful merit." Mr. McAdam is now in Central Africa and will not have immediate opportunity of correcting this misunderstanding, and I therefore venture to speak for him. In each of the 10 patients who suffered a spread of infection to a joint the septic arthritis was present when the patient first came under treatment, and infection did not in any case spread to a joint after treatment was begun. The occurrence of joint infection in these patients cannot therefore be used as an argument against the management which Mr. McAdam recommends.

Edinburgh. IAN AIRD.

1. *Brit. J. Surg.* 1945, 33, 167.

A NEW society, to be known as the Irish Tuberculosis Society, was formed by county and assistant county medical officers of health and resident staffs of sanatoria at a meeting at University College, Dublin, on April 13. The object is the study of all aspects of tuberculosis in Ireland, for which purpose clinical meetings will be held at various centres. Ordinary membership is open to all medical practitioners, the annual subscription being 10*s.* 6*d.* The hon. secretary may be addressed at the Hospital, Newcastle, co. Wicklow.

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Parliament

THE HEALTH BILL IN COMMITTEE

VACCINATION AND DIPHTHERIA IMMUNISATION

WHEN the committee reassembled on June 18 it considered clause 26. Mr. SOMERVILLE HASTINGS questioned the wisdom of local authorities being able to arrange for vaccination and other forms of immunisation with any practitioner; in particular, diphtheria immunisation, which was still on trial, called for careful observation. Mr. H. N. LINSTEAD asked why compulsory vaccination was to be stopped. Was it because many were contracting out, or on medical grounds, or because improved conditions of hygiene had rendered it superfluous?

Mr. A. BEVAN replied that, while specialised knowledge might be needed for some forms of inoculation, general forms could suitably be undertaken by the general practitioner. Compulsory vaccination was being dropped partly because people were contracting out; he hinted at an alternative approach in recalling remarkable results which were being achieved by the Ministry's propaganda for diphtheria inoculation. Clause 26 was ordered to stand.

AMBULANCE SERVICES

Mr. C. W. KEY moved an amendment to clause 27, to make it clear that the obligation for the provision of an ambulance rests with the area in which the need arises, whatever may be the ambulance's destination. The amendment was carried.

Mrs. E. M. BRADDOCK contended that the ambulance services should be organised in regions composed of a number of areas. The method proposed in the Bill encouraged duplication, difficulty, and delay. There should also be a central regional bed-bureau, to which four-hourly returns of hospital bed states should be made. Mr. FREDERICK MESSER emphasised the need for speed in the ambulance service. There would be needless delay if hospital authorities must first apply to public-health authorities; within the hospital area, ambulances should be available to the hospital on demand. Hospital workers had expressed the hope of a national ambulance service.

Mr. H. U. WILLINK maintained that regional boards were not suitable bodies for the control of ambulances; as proposed in the Bill, control should normally be in the hands of counties and county boroughs, and the Minister should be given discretion to extend the units if need arose. Dr. H. B. MORGAN urged the Minister to place ambulances under regional control, with power of delegation. Ambulance workers were trying to form an institute, so that all would be suitably trained, but there was at present nothing to compel the voluntary bodies to see that ambulance personnel were properly trained. Mr. BEVAN denied that regional control would be more efficient than that by the county or county borough. Clause 27, as amended, was ordered to stand.

AFTERCARE

Mr. P. PIRATIN moved an amendment to clause 28 (prevention of illness, care, and aftercare) to obtain a clarification of how patients within these categories were to be paid. Mr. MESSER said that memo. 226T, which gave authority for payments to those tuberculous patients who had a prospect of returning to industry, had been an advance; but no similar allowance was made in the Bill. Perhaps the Minister might add to the section prohibiting local health authorities from making payments some words such as "except for such purposes as the Minister may determine."

Mr. BEVAN replied that there were a number of residual categories which had been dealt with in neither the insurance nor the health scheme; these would be covered in a third Bill, which he would introduce. The defect of the existing system of payment to tuberculous patients was that payments ceased when the condition was found to be incurable. The amendment was withdrawn.

Mr. PIRATIN moved that the subsection empowering local health authorities to recover charges for services under this section, according to the patient's financial capacity, should be omitted. This, he said, was redolent of the means test; if aftercare was important, it should be free, as were other forms of treatment. Mr. BEVAN contested the justice of this observation. Where, for example, domestic assistance was needed, people should pay for it according to their financial position. This was a means test to give, not to withhold, since it concerned additional services. Dr. MORGAN agreed that the services foreseen in the clause were not part of the medical service as such. The motion was negatived.

Mr. BEVAN, replying to a question by Mr. WILLINK, denied that dangerous confusion could arise between the terms of clauses 25 and 28. Clause 25 referred to trained nurses, whereas clause 28 allowed for such provisions as a change to a suitable occupation to prevent illness; this might be arranged by the local authority, and might include special sleeping arrangements for the tuberculous patient. Under this clause, too, local authorities might establish special colonies; and under it came the case of children in crowded tuberculous households. The clause was ordered to stand.

DOMESTIC HELP

Mr. KEY obtained the committee's approval for an amendment to clause 29, extending the upper age-limit of children on account of whom domestic help may be claimed from five to the limit of the compulsory school age, as defined in the Education Act, 1944. The clause, as amended, was ordered to stand.

THE APPOINTED DAY

Mr. BEVAN said that before the appointed day much administrative work would have to be done. Shortage of medical and dental staffs must be overcome. There would be, too, a dearth of health centres; he inclined to the view that old buildings should be adapted for use as centres. It was intended that the Bill should come into full operation on April 1, 1948, and the date should be synchronised as far as possible with the Insurance Bill. In the meantime, the Health Bill would be brought into operation by stages; it was impossible to be more precise at this juncture. Clause 30 was ordered to stand.

EXECUTIVE COUNCILS

In reply to questions by Mr. LINSTEAD and Mr. WILLINK, Mr. BEVAN said that clause 31 allowed for variations by the Minister in the constitution of executive councils because joint executive councils would be needed for very small counties, and some of their functions might be suitably spread over a wider area than the local-authority area. It might be necessary for some areas, especially rural, to be more weighted than others. The clause was ordered to stand.

LOCAL REPRESENTATIVE COMMITTEES

Under clause 32, Mr. WILLINK moved an amendment that the name "Local Medical Committee" should be substituted for "Medical Practitioner Committee." The amendment was carried and the amended clause was ordered to stand.

GENERAL MEDICAL SERVICES

Mr. R. LAW moved an amendment allowing for the payment by salary in addition to capitation fees of doctors working in rural areas or where otherwise a satisfactory medical service could not be obtained. The aim was to ensure that areas liable to be under-doctored should be adequately cared for through this added inducement to practise there. Where there was no such special purpose, payment should be by capitation fees only. Mr. Bevan proposed revolutionary changes in the system of medical practice, but there was no word of the conditions in the proposed State service. The two outstanding conclusions in the Spens report had been that monetary reward must be sufficient if the general-practitioner service was not to deteriorate, and that the skilled, conscientious, and able man should benefit financially and the exceptional man should get a very high salary. To attain these objectives, payment by basic salary must be abandoned, except in special areas. If the Minister accepted the principles enunciated in the report, how could he make them effective by basic salaries? The only possible criteria under such a system would be age and length of service; the difficulty could be got round only by letting the patient judge the merits of his doctor.

Mr. Bevan suggested that it was undesirable to include the method or amount of remuneration in a Bill; these would better be decided by regulation, for otherwise a Bill would be needed for each subsequent modification. He acknowledged the value of the Spens report. He

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was convinced that a basic salary was necessary; it would, for example, provide the young doctor with a livelihood. It was difficult to reconcile a free choice of doctor with the abolition of capitation fees; these were necessary, but a ceiling might have to be set to their amount after arbitration with the profession's representatives. He favoured a basic salary, weighted to bring doctors into the special areas.

Mr. J. S. C. REID said that in a salaried service the State would come in as a third party in the doctor-patient relationship; he was against such intervention. To leave a blank cheque on an issue of this importance was wrong; the Bill should contain a clear statement of the method of payment. No argument had been advanced from the Government benches in favour of salaries in the ordinary areas, presumably because the argument was purely doctrinaire—that doctors should be State servants Young doctors start as assistants but their position was not clear. Why, under the system of diminishing capitation fees, should the more efficient doctor be paid less on an average for each patient than the bad one?

The committee then adjourned.

Obituary

JAMES TAYLOR

C.B.E., M.A., M.D. EDIN., F.R.C.P.

Dr. Taylor, who died at his London home on June 6 at the age of 87, was best known to the profession as a writer on neurological subjects and as editor and interpreter of the works of Hughlings Jackson.

James Taylor began his medical studies much later in life than most students, for after leaving school he started as a bank clerk. This did not appeal to him, and he felt a call to medicine. He was educated at Forres Academy and Edinburgh University, where he graduated M.A., with honours in natural science, in 1883, M.B. in 1886, and M.D. in 1890. He supplemented his meagre resources by acting as tutor during his spare time and holidays. After qualifying he held appointments as house-physician at the Royal Infirmary and the Hospital for Sick Children, Edinburgh, before coming to London, where he held a similar post at the National Hospital, Queen Square. Risien Russell, an Edinburgh graduate and a friend of Taylor's, was at the time house-physician at that hospital, and told him of the wonderful work being done there. Taylor received much help and encouragement in these early years from Hughlings Jackson, and became his friend and favourite disciple. He was to be associated with the National Hospital for the rest of his working life, as senior house-physician, pathologist, physician, and finally consulting physician; and even after his retirement the connexion was maintained by his work on the board of management. He was also physician to the Royal London Ophthalmic Hospital and the Queen's Hospital for Children, and consultant to the Osborne Convalescent Home for Officers; for some years he was medical referee to the Pensions Commutation Board, and chief physician to the Guardian Assurance Company. He was a councillor of the Royal College of Physicians in 1917–19, and examiner in 1920–24. He was at various times president of the Harveian Society, president of the ophthalmology and neurology sections of the Royal Society of Medicine, and secretary of the Ophthalmological Society. In 1920 he was appointed C.B.E.

He was one of the first to describe, in 1895, subacute combined degeneration of the spinal cord; and in 1899 he helped Sir William Gowers to prepare the third edition of his *Manual of Nervous Diseases*. In 1905 he published *Paralysis and other Nervous Diseases in Early Life*, and he contributed articles on occlusion of cerebral vessels and on cerebral palsies of children to the 1910 edition of Allbutt and Rolleston's *System of Medicine*. He also wrote numerous articles in *Brain* and other journals. After retiring from the active staff of the National Hospital, he devoted much time to collecting and editing the writings of his teacher, Hughlings Jackson; and *Neurological Fragments*, published in 1925, contained a charming biographical introduction from his pen. With the assistance of Dr. Gordon Holmes and Dr. F. M. R. Walshé, he edited *Selected Writings of Hughlings Jackson*, published in 1931–32. The two volumes of this work brought to many a better conception of what Hughlings Jackson had taught; the collection and selection of material from numerous short papers, the elimination of repetition, and the arrangement of the remainder in a form which conveyed the complete teaching of this pioneer neurologist, was a labour which could have been undertaken only by a devoted pupil. James Taylor's literary work was distinguished by an easy and graceful style, by wide knowledge, and by strict adherence to facts.

As a clinician, he had not only a vast experience in neurology but an intimate understanding of children's diseases and of ophthalmology as it concerns the physician. His many friends will not forget the strength and integrity of his character and his never-failing tact and kindness. He married in 1905 Elizabeth Marian, daughter of Charles E. Cooke, of Weasenham, Norfolk, and they had one daughter.

ARTHUR FRANCIS VOELCKER

M.D. LOND., F.R.C.P.

Dr. A. F. Voelcker, consulting physician to the Middlesex Hospital and to the Hospital for Sick Children, Great Ormond Street, died at his home near Bude on June 9 in his 85th year.

Son of the late August Voelcker, F.R.S., he was educated at University College School and Hospital, where he qualified in 1884, taking his M.B. two years later. After Wanderjahre spent at the medical schools of Berlin, Vienna, and Paris he returned to London and was appointed to the staff of the Middlesex and Great Ormond Street. His work at these hospitals made him an accomplished physician and a skilled diagnostician. Slow and deliberate in speech and in examining patients his rounds were often protracted, but nothing was too trivial for his attention, and he always seemed to have plenty of time, while his unflagging energy became a byword. "Nearly 50 years ago," C. E. L. writes, "in the children's out-patient department of the Middlesex Hospital I was impressed by his intimate knowledge of all that went to the making of a child. He knew the Christian names of his little patients, was infinitely patient with their whims and behaviour, and in consequence was adored by their mothers who thought there was no-one—and there were not many—like 'Dr. Volliker,' as they called him." F. B., who was one of his patients, adds:

"Though I am sad I never was Voelcker's house-physician, yet, had I been, I doubt I should have learnt more of his art than I did in the 20 years I was his patient—from my infancy to his retirement. He had endless patience, took endless care, was never hurried. He was a general consulting physician, with a deep contempt for the narrow blinkered specialist who never relates the physical problems of his patients to the far wider problems of their lives. Kindness, humour, learning, a sense of proportion—these were some of the ingredients of his wisdom. Whenever I am tempted to be lazy and to hand my responsibilities over to the biochemist and the radiologist I think of Dr. Voelcker's amused smile when he saw biochemical reports, and I refrain. Whenever I am tempted to be clever I think of Dr. Voelcker saying to my school doctor that though I could have a vaccine made from the boils on my face it would be simpler and better for me to scald my shaving brush. Whenever I hesitate about whether some treatment is necessary I hear Dr. Voelcker say: 'In striving for what's better we often mar what's well.' Whenever I am wearied by patients I think of Dr. Voelcker postponing a holiday in Scotland to see me. I can only hope that a little of the debt I owe to him I can repay to my own patients."

As a teacher he was in the first rank. His clinical work, as was not uncommon in those days, was soundly based on a long and varied pathological experience, and for many years he was lecturer in medicine and pathology at the Middlesex. One of his students writes: "He expected precision in our answers, but his questions were accompanied by a twinkle in the eye and he would take endless pains to develop our powers of eliciting physical signs and of appreciating their significance." A great lover of books, he had a profound knowledge of the odd writers of medicine and when president of the Middlesex students' medical society he would arrive with an armful of first editions of medical classics. An exami-

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ner for the universities of Aberdeen and Birmingham, the Society of Apothecaries, and the Conjoint Board, he also served the section of medicine of the Royal Society of Medicine as president. For many years he was librarian to the Medical Society of London and in his presidential address to that body in 1918 he dealt crisply with topics—such as a State medical service and better pay for nurses—which are still of contemporary interest.

In earlier years Voelcker had made a name as a cross-country runner, and through life he kept his upright athletic figure. The younger generation marvelled that a man of over 80 should still be taking cold baths. His holidays were usually spent with his rod and gun in Devon and Cornwall, where he later retired. "Dr. Voelcker," writes R. A. Y., "was a man of great charm with many friends to whom he was an admirable host both in Harley Street and later at his home in Cornwall. He had a pleasant sense of humour, though his deliberate expression sometimes robbed his witty comments of the spice of spontaneity. He could be caustic but never unkind, since he was himself too sensitive to be capable of wounding others."

ERNST FREUND

M.D. VIENNA

Prof. Ernst Freund, who died on June 6 in London at the age of 82, was born at Karbitz near Aussig in Czechoslovakia in the old Austrian Empire. He received his medical education at the German university in Prague, and held posts in that city, in Strassburg, and Vienna. For a short period, from 1906 to 1911, he practised in his native town and then moved to Vienna, where he became a specialist in internal medicine. For the next 25 years he was chief of the department of physiotherapy at the Wenkebach Clinic and was responsible for all physiotherapy and the treatment of rheumatic diseases not only in his own wards but throughout the hospital. He lectured in the same subjects, and his research work and publications on these alone number 45. He was perhaps best known in this country for his book *The Importance of Biochemistry in the Investigation of Rheumatic Diseases*. His last two years in Vienna before he was dismissed without notice by the Nazis in July, 1938, were occupied as chief physician to the Krankenhaus der Kaufmannschaft, founded for patients sent in by industrial and social insurance societies.

Freund was an indefatigable and prolific worker. At 75, an outcast from the country of his adoption and unable to return to the land of his birth because it was already threatened with invasion, he came to England with the Pearson Foundation, of which he had become director before leaving Vienna. This foundation was established in Vienna at a cost of half a million pounds by Mr. Frederick Pearson, an American philanthropist. It consisted of a hospital and laboratories for the treatment and investigation of cancer. The whole organisation was moved to London and became attached to the West London Hospital, Hammersmith. Many years previously Freund had begun to work at cancer and had evolved theories of causation and treatment to which he stubbornly adhered despite much criticism. He had already in Vienna gained an international reputation for his care of patients suffering from this disease and many were sent to him in forlorn hope. At one time at the Mount Vernon Hospital his regime was given a trial but as is so often the case when benefits cannot be measured the treatment seemed less valuable than in the hands of its originator. Nevertheless for another 7 years as an exile he applied his energies to the investigation of this disease.

Professor Silberstein recalls that Freund's researches covered a wide field, and more than 200 papers appeared under his name. Thus he contributed some outstanding investigations to the problem of blood-clotting, and one of the results of his work was the use of sodium citrate as an anticoagulant. He also studied the absorption of the products of digestion in normal and pathological conditions, and investigated the mechanism of protein synthesis in the body. Several of his papers dealt with the biochemical aspects of tuberculosis. "Long before the part played by *Bact. coli* in supplementing the vitamins of the body was recognised, Professor Freund stressed the importance of maintaining a normal bacterial flora in the gut."

Medical Diary

JUNE 23–29

Tuesday, 25th

EMPIRE RHEUMATISM COUNCIL: Postgraduate Course in Rheumatic Diseases at B.R.C.S. Clinic for Rheumatism, Peto Place, Marylebone Road, London, N.W.1.
4 P.M. Lord Horder: Inaugural lecture.
5 P.M. Dr. M. B. Ray: Environment, Climate, &c.

PADDINGTON MEDICAL SOCIETY
8.45 P.M. (St. Mary's Hospital, Paddington.) Films: Gas-air Analgesia in Midwifery; and the Production and Distribution of Medical Gases.

Wednesday, 26th

EMPIRE RHEUMATISM COUNCIL
12 NOON. Dr. W. Tegner: Rheumatoid Arthritis.
4 P.M. Dr. B. Schlesinger: Still's Disease.
5 P.M. Dr. E. Samuel: X-ray Diagnosis.

MEDICAL SOCIETY OF THE L.C.C. SERVICE
4.30 P.M. (County Hall, Westminster Bridge, S.E.1.) Mr. W. Ritchie Young: Dental Disease in its relation to Ill Health.

Thursday, 27th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. Arnold Sorsby: Genetic Aspects of Ophthalmology.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Ophthalmology.* Mr. Frederick Ridley: Survey of Recent Developments in the Manufacture of Fitting and Prescription of Non-moulded Contact Lenses. Cases will be shown at 4.30 P.M.

EMPIRE RHEUMATISM COUNCIL
12 NOON. Dr. K. Stone: Spondylitis.
4 P.M. Dr. E. Fletcher: Osteoarthritis.
5 P.M. Dr. J. W. T. Patterson: Physical Methods in Rheumatic Diseases.

MEDICO-LEGAL SOCIETY
8.15 P.M. (26, Portland Place, W.1.) Mr. T. Paterson Owens: Approved Schools and Remand Homes.

EDINBURGH POSTGRADUATE LECTURES
4.30 P.M. (Royal Infirmary.) Dr. W. I. C. Morris: Outlet Contraction of the Pelvis. (Honyman Gillespie lecture.)

Friday, 28th

FACULTY OF RADIOLOGISTS
10 A.M. (Royal Infirmary, Glasgow.) Annual meeting.

EMPIRE RHEUMATISM COUNCIL
12 NOON. Mr. P. Ascroft: Disk Syndrome.
4 P.M. Dr. G. Kersley: Gout.
5 P.M. Dr. W. S. C. Copeman: Nonarticular Rheumatism.

Saturday, 29th

FACULTY OF RADIOLOGISTS
10 A.M. (Natural Philosophy Department, Glasgow University.) Annual meeting, continued.

EMPIRE RHEUMATISM COUNCIL
10 A.M. Dr. J. W. Shackle: Pathological Investigation in Rheumatism.
11 A.M. Mr. W. D. Coltart: Orthopædic Aspects.
12 NOON. Dr. B. Nisse: Social and Industrial Aspects.

Births, Marriages, and Deaths

BIRTHS

FISHMAN.—On June 12, in London, the wife of Dr. Maurice Fishman—a son.

KENDERDINE.—On June 11, at Walthamstow, the wife of Captain A. R. Kenderdine, R.A.M.C.—a daughter.

MARSH.—On June 13, at Ealing, the wife of Dr. E. L. Marsh—a daughter.

PENISTAN.—On June 14, in London, the wife of Major John Penistan, R.A.M.C.—a son.

REID.—On June 6, at Colchester, the wife of Mr. Ronald Reid, F.R.C.S.—a son.

SPILLANE.—On June 8, in London, the wife of Dr. John D. Spillane—twin son and daughter.

WILLSON.—On June 7, at Derby, the wife of Flight-Lieutenant Gordon F. Willson, M.B., R.A.F.V.R.—a son.

MARRIAGES

MORRIS—WILSON.—On June 1, in Exeter, Ian Benson Morris, M.B., of Canterbury, to Ann Thurburn Wilson.

READ—BOUMAN.—On June 7, in London, Andrew Mabyn Read, M.R.C.S., to Rini Bouman.

REWELL—WILLIS.—On May 24, at Downe, Kent, Reginald Elson Rewell, M.D., M.R.C.P., to Betty Jean Willis.

WILSON-SHARP—JENKINS.—On June 14, in London, Cecil Derek Wilson-Sharp, M.B., flying-officer R.A.F., to Elaine Jenkins.

DEATHS

JEFFREYS.—On June 12, at Bath, Herbert Castelman Jeffreys, B.A. Oxfd, M.R.C.S., formerly of the Colonial Medical Service, Nigeria.

KING.—On May 29, at Durban, South Africa, Gordon Burnham King, F.R.C.S.E., aged 59.

SHARMAN.—On June 10, Henry Sharman, M.D. Lond., of Southway, N.W.11.

STEWART.—On June 7, at Dundee, John Duke Stewart, M.A., M.B. St. And.

VOELCKER.—On June 9, at Marhamchurch, Bude, Arthur Francis Voelcker, M.D. Lond., F.R.C.P., aged 84.

WALFORD.—On June 7, Reginald Manwood Hodson Walford, M.R.C.S., of Hampstead, aged 80.

WILKINS.—On June 13, Edgar Henry Wilkins, M.B. Dubl., D.P.H., of Wylde Green, Birmingham.

WILLIAMSON.—On June 4, at Frinton-on-Sea, Alexander Jeans Williamson, M.B. Edin., lieut.-colonel R.A.M.C., retd.

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Notes and News

A RHEUMATISM UNIT

AT the Three Counties Emergency Hospital, Arlesey, the new British Legion unit for the study and treatment of rheumatism, recently described by Lord Horder in our correspondence columns,[1] is now at work. This fifty-bed unit is in the country, with a home-farm attached; its patients, who are all ex-Service men and women, are resident, but can keep in touch with friends and relations over long periods of treatment thanks to an almost daily ferry service arranged by the joint council of the Order of St. John and the British Red Cross Society. Being linked with the Royal Free Hospital the unit has access to the consultant staff and the general and special departments of the parent hospital, and the senior dermatologist, ear, nose, and throat specialist, and the senior neurologist visit weekly. Lord Horder is consultant observer to the unit, the care of the patients is in the hands of a group of rheumatologists, and treatment is conducted in a placid atmosphere summed up in the words: "No hurry, no worry, and we will see you back among the wage-earners if possible."

The condition of each patient is first studied, diagnosed as accurately as possible, and assessed for treatment along well-tried lines. The New Zealand division of the Legion have seconded to the unit their chief physiotherapist, Captain Guyton, as supervisor of reablement, and he arranges occupational and diversional therapy and recreation, and helps patients to find jobs on their return to work. The Ministry of Health have approved the appointment of a resident medical officer specialising in rheumatism. The Legion hope that similar units may be established in other parts of the country by local authorities and others interested in the great body of rheumatic people in Great Britain.

THE FOOD WE EAT

THE authors of *Chemical Composition of Foods* have compiled a second edition [2] which incorporates many new foods, particularly those which war conditions have made popular, or at least familiar. All the commoner foodstuffs and a number of compound dishes—over 600 in all—have been examined; vitamins are excluded, but otherwise all the important organic and mineral contents in the raw and prepared states have been estimated. Research of this kind is laborious and technically exacting; up to twenty different constituents may have to be determined in a single foodstuff, and the analysis of almost every fresh substance presents problems that may take weeks or months to solve. Few have the patience needed for such research. The perseverance of Prof. R. A. McCance and Miss Widdowson has already been acknowledged in the steady demand for the first edition, which was reprinted several times; there is no doubt that this little book will continue to be a standard work of reference for all concerned with the technical aspects of nutrition.

COPPER IN BLOWFLIES

COPPER, to the extent of 0·5 to 60 mg. per 100 g. dry weight, has been found in all insects which have been histochemically examined. At one time it was thought to occur as the respiratory pigment hæmocyanin, which is found in other arthropods. Later work, however, has somewhat discredited this view, and it has been shown that simple solution will account for the oxygen-carrying capacity of the blood of all insects except the hæmoglobin-containing species. Waterhouse [3] has measured the intake and distribution of copper in various organs of the larvæ of blowflies, which are serious pests affecting sheep in Australia. Owing largely to its oligodynamic action, copper is toxic in very low concentrations to various organisms—indeed, in Australia a 5% aqueous solution of copper sulphate used to be employed extensively as a dressing for blowfly "strike" of sheep. Waterhouse shows that the addition of 2% copper sulphate to the feeding medium of blowfly larvæ has little effect on their rate of growth or the final size they attain, though the total copper in their bodies is increased to about five times that of larvæ in the normal medium. Evidently the growing tissues possess a fairly wide toleration for copper, but this dosage nevertheless exercises a deleterious effect which is reflected in a reduction in the proportion of adults which emerge.

1. *Lancet*, June 8, p. 870.
2. McCance, R. A., Widdowson, E. M. *Spec. Rep. Scr. med. Res. Coun., Lond.* no. 235. H.M. Stationery Office. 6*s*.
3. Waterhouse, D. F. Studies of the Physiology and Toxicology of Blowflies, parts 10 and 11. *Council for Scientific and Industrial Research, Melbourne*, Bulletin no. 191, 1945.

INFORMING THE GERMAN SCIENTIST

ACCORDING to the Berlin correspondent of the *Manchester Guardian* (June 7 and 13), time is being wasted by German workers in trying to rediscover the best methods of processing penicillin, which are already known and used in Britain. Penicillin that is being made at the Schering pharmaceutical works in Berlin has only about one-tenth the potency of that obtained by methods current in England. A further impediment is the zone system; penicillin is being made in the American area, but there is almost no knowledge in Berlin of what is being done there. Biochemists at the Koch laboratories have great difficulty in obtaining news from other countries: their contact with developments elsewhere is confined to occasional copies of the leading British medical journals, *Nature*, and UNRRA publications; they never see specialised journals or technical works in their own field. British doctors in the Military Government are appalled by the Germans' mental isolation. It is understood that the British Medical Association has agreed to supply medical literature for a central reference library, and the hope is expressed that as many scientific associations as possible will send copies of their journals and reports of proceedings.

PETHIDINE

UNDER an Order dated June 14, pethidine and its salts are placed in part 1 of the Poisons List and on the first schedule. This means, in effect, that preparations containing pethidine, however small the amount, can be obtained only on a doctor's prescription or by signing a pharmacist's poisons register.

University of Cambridge

Dr. R. Williamson has been appointed reader in morbid histology, from Oct. 1.

University of London

The honorary degree of D.SC. is to be conferred on Prof. E. D. Adrian, F.R.S., and Sir Henry Dale, F.R.S., in connexion with the celebration of Foundation Day next November.

University of Sheffield

Mr. Michael F. A. Woodruff has been appointed full-time tutor in surgery.

University of Aberdeen

Dr. W. M. Millar has been appointed lecturer in mental health in the university.

General Medical Council

The result of the voting in the recent elections of five direct representatives for England, one for Scotland, and one for Ireland, was as follows:—

IN ENGLAND	
HARRY GUY DAIN, M.D., F.R.C.S.	12,208
Sir ERNEST KAYE LE FLEMING, M.D.	11,477
NOEL EVERARD WATERFIELD, M.B., F.R.C.S.	10,081
JOHN WARDLE BONE, M.B., B.SC.	9822
EDWARD ANDREW GREGG, L.R.C.P.I.	9776
LESLIE WILLIAM HEFFERMAN, M.D., F.R.C.S.	4556
JAMES EDGAR OUTHWAITE, M.B.	4459
WILLIAM WALTERS SARGANT, M.B., M.R.C.P.	4103
WILLIAM FRASER, M.B.	3738
WILLIAM MACLEOD, M.B.	3412
ALBERT JAMES CLARKE, M.B.	3378
GORDON REGINALD WARD, M.R.C.S.	3202
LOUIS FRANCIS BECCLE, M.B.	2950
IN SCOTLAND	
ROBERT WILLIAM CRAIG, O.B.E., M.D.	2490
JAMES BURNET, M.D.	1107
IN IRELAND	
FRANK KANE, M.D.	1334
ALFRED CHARLES SEYMOUR, M.B.	535

Royal Institute of Public Health and Hygiene

Mr. William H. Feldman, D.SC., of the Mayo Foundation, Minnesota, will deliver the Harben lectures at the institute, 28, Portland Place, London, W.1, on Monday, Tuesday, and Wednesday, July 15, 16, and 17, at 3 P.M. He is to speak on the Chemotherapy of Tuberculosis—including the use of Streptomycin.

Maternity and Child Welfare Conference

The National Association of Maternity and Child Welfare Centres has arranged, on behalf of the National Council for Maternity and Child Welfare, a conference to be held at Friends House, Euston Road, London, N.W.1, on June 27 and 28, starting at 10.30 A.M. on each day. Subjects will include planning, making, and running a home; the incidence of dental caries, and the care of teeth of expectant and nursing mothers and children under five years; and the care and treatment of the handicapped child. Mr. Aneurin Bevan, the Minister of Health, will deliver the presidential address at 10.30 A.M. on June 28.

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Royal College of Surgeons of England

At a meeting of the council on June 13, Sir Alfred Webb-Johnson, the president, received from Sir William H. Collins a cheque for £100,000 which was promised in February last as a further gift for the scientific departments of the college, in encouragement of the project for an Academic Medical Centre in Lincoln's Inn Fields.

Prof. E. C. Dodds, of the Middlesex Hospital, was presented with a cheque for £1000, being a prize given to him by Mr. Charles Mayer, of New York, in recognition of his work in discovering and studying stilbœstrol, and as a contribution for his further researches in the field of synthetic hormones.

The following examiners were elected for the ensuing year:

Primary fellowship.—Anatomy: Surgeon Rear-Admiral C. P. G. Wakeley, Prof. H. A. Harris, Mr. E. C. B. Butler, and Mr. James Whillis. Applied physiology and pathology: Prof. R. J. S. McDowall, Prof. Geoffrey Hadfield, Prof. W. G. Barnard, and Prof. Samson Wright.

Diploma of L.R.C.P., M.R.C.S.—Elementary biology: Mr. A. E. Ellis, Mr. Wilfrid Rushton, D.SC., Dr. E. I. Jones, and Mr. J. H. Elgood. Anatomy: Prof. John Kirk, Prof. Mary F. L. Keene, and Mr. A. M. A. Moore. Physiology: Prof. R. J. S. McDowall. Midwifery: Miss Alice Bloomfield, Mr. A. O. Gray, Mr. N. L. White, and Mr. H. G. Kirwan-Taylor. Pathology: Mr. Reginald Vick, Dr. J. F. Taylor, Mr. L. R. Broster, and Dr. H. W. Clegg.

Diploma in Public Health.—Part I, Dr. J. D. Benjafield; Part II, Dr. J. A. Struthers.

Diploma in Ophthalmic Medicine and Surgery.—Part I, Mr. J. H. Doggart and Mr. G. J. O. Bridgeman; Part II, Mr. T. M. Tyrrell.

Diploma in Psychological Medicine.—Part I, Dr. D. H. Brinton.

Diploma in Laryngology and Otology.—Part I, Mr. L. G. Brown and Mr. C. A. Keogh; Part II, Mr. C. P. Wilson.

Diploma in Medical Radiodiagnosis.—Part I, Prof. F. L. Hopwood; Part II, Mr J. L. A. Grout.

Diploma in Medical Radiotherapy.—Part I, Prof. F. L. Hopwood; Part II, Mr. G. F. Stebbing.

Diploma in Anæsthetics.—Dr. W. A. Low and Dr. E. S. Rowbotham.

Diploma in Child Health.—Dr. Wilfrid Sheldon and Mr. T. T. Higgins.

Diploma in Physical Medicine.—Part I, Dr. Philippe Bauwens and Mr. A. M. A. Moore; Part II, Mr. N. St. J. G. D. Buxton and Dr. F. S. Cooksey.

A diploma of membership was granted to T. L. T. Lewis.

Diplomas of fellowship were granted to the following:

L. O. Knox, William Bullock, S. H. C. Clarke, G. C. Tresidder, J. F. H. Bulman, W. M. H. Shaw, C. J. Evans, R. S. Murley, J. H. Penrose, B. J. Harries, H. F. Lunn, J. S. H. Wade, P. F. Milling, R. C. Barclay, Muriel Crouch, J. W. P. Gummer, G. K. Tutton, W. J. Atkinson, Carolina M. van Dorp, F. R. Wilde, Arnold Elton, P. R. N. Kerr, M. E. Minchin, T. L. T. Lewis, G. D. Adhia, S. G. Aitken, C. E. Baker, E. V. Barling, A. K. Basu, John Borrie, J. K. Bors, W. S. Charlton, W. P. Cleland, Kevin Coen, V. V. Da Silva, J. B. Devine, M. R. Ewing, G. J. Fraenkel, H. K. M. A. Hassab, G. F. Homer, F. L. Hutter, A. M. Khan, M. M. Kinawy, R. J. B. McEwen, J. W. McNamara, G. B. Morris, Rameash Nigam, R. A. C. Owen, N. K. Parikh, A. P. R. Pinto, V. G. Renowden, D. G. Simpson, J. M. Tainsh, and D. F. Thomas.

Diplomas in anæsthetics were granted jointly with the Royal College of Physicians to the following:

R. E. Adam, A. F. Alsop, F. J. Aumonier, J. W. L. Bain, C. T. Barry, V. T. Baxter, P. H. Blackiston, J. A. Bolster, J. D. Bourke, A. K. Brown, C. H. Bulcock, J. H. Capon, P. S. Cheshire, K. S. Crawford, G. N. Deshmukh, Stafford Dobbin, T. M. Doran, G. A. Eason, Bernard Fairburn, J. N. Fell, Eileen M. R. Ghey, D. T. Gilchrist, Alexandra Goldblat, D. W. F. Gotla, H. W. C. Griffiths, Eileen M. L. Gunderson, John Halton, Margaret D. W. Hamilton, A. W. Hardie, J. B. Hargreaves, A. G. Hegarty, P. J. Helliwell, A. J. H. Hewer, Edward Holden, Elizabeth A. Hoult, D. D. C. Howat, E. G. Hudson, Edward James, Flavia Z. L. B. James, Emily E. Johnson, D. S. Jones, Olive M. G. Jones, W. M. Jones, B. S. Kent, R. C. Lawrence, Robert Lawrie, Janet E. Leng, J. M. Lockett, Kevin McCaul, Elizabeth McKenzie-Newton, Duncan Macpherson, F. W. Marshall, Sheila Millar-Danks, P. L. F. Mortimer, J. F. Perredes, Marie E. Potter, K. J. Powell, I. A. Schalit, Malcolm Shaw, A. D. Sinclair, J. A. Smart, James Sneddon, L. W. Spratt, G. S. Steele-Perkins, Earl Stevenson-Wright, Margaret M. G. M. H. Sweeney, A. I. Ward, Kathleen M. Watson, O. M. Watt, R. J. Whiting, and Dora M. Young.

The following hospitals were recognised for the six-months resident surgical post required of candidates for the final fellowship examination:

Prince Bijey Singhji Memorial Hospital, Bikaner (three general house-surgeons); Central Middlesex Hospital (the third surgical A.M.O. and three additional surgical posts for as long as the Ministry of Health scheme for ex-Service men is in force); and Clatterbridge General Hospital, Bebington (R.S.O.).

Tata Memorial Trust

The following awards will be made by the trust in October for research in blood diseases, with special reference to leukæmia.

Grants for expenses and assistance: Dr. Jørgen Bichel (Denmark); Dr. Pierre Cazal (France); Dr. Peter A. Gorer (Great Britain); Dr. Maurice Guérin (France); Dr. Werner Jacobson (Great Britain); Dr. Edith Paterson (Great Britain); Prof. Edoardo Storti (Italy).

Scholarships (whole-time or part-time): Dr. Jal J. Dubash (India); Dr. Pierre Dustin (Belgium); Dr. Simon Iversen (Denmark); Dr. Joseph Japa (Poland); Dr. Hall Schartum-Hansen (Norway).

Royal Medical Benevolent Fund

Speaking at the annual general meeting on June 12, Sir Arnold Lawson, the president, said that in spite of the war the fund was able to contribute more than ever before to the relief of poverty and distress, for the number of subscribers was in excess of all previous records, and legacies had been more abundant than ever before.

A step forward had been taken in the project of providing homes for old and infirm doctors, and the fund was negotiating for the purchase of a house on Putney Hill, easily accessible to shops, cinema, and church, which would accommodate about a dozen elderly ladies. For a small rental each would have her own bed-sitting room where she could make a simple meal, and there would also be a communal sitting-room and dining-room. The fund would see to it that nobody was excluded on financial grounds. "The whole project," Sir Arnold continued, "is an ambitious one—worthy of this great fund. I have no doubt of its success nor of the great benefits that will thereby accrue to our old people; but to carry out the complete scheme as we visualise it is going to cost a very great deal of money; and how much we can enlarge it to the extent of buying more property and building, perhaps, a small nursing-home, depends upon the generous support of our medical colleagues."

London Hospital

Sir Edward Peacock, treasurer of the King Edward Hospital Fund, will present the prizes in the library of the medical college on Thursday, June 27, at 3 P.M.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. H. E. HARDING, F.R.C.S., 53, New Cavendish Street, W.1.
Dr. CHRISTOPHER HARDWICK, Nuffield House, Guy's Hospital, London, S.E.1.
Mr. A. J. KING, F.R.C.S., 9, Weymouth Street, W.1.

Prize in Ophthalmology

The Treacher Collins prize of £100 has been instituted by the Ophthalmological Society of the United Kingdom as a triennial award for the best essay on a subject selected by the council. The prize will next be given for an essay on Nutritional Eye Disease, which must be submitted before Dec. 31, 1947. Further particulars may be obtained from the society's secretary, 5, Racquet Court, Fleet Street, London, E.C.4.

British Empire Leprosy Relief Association

The annual general meeting of the association will be held at the India Office, Whitehall, S.W.1, at 3 P.M. on Wednesday, June 26. The speakers will include Sir Bernard Bourdillon, chairman of the executive committee, and Dr. T. F. Davey, superintendent of the Uzuakoli leper settlement in S.E. Nigeria.

Appointments

COOK, L. G., M.B. N.Z.: clinical pathologist, i/c city laboratory, City General Hospital, Sheffield.

COPE, J. W., M.B. Camb., F.R.C.S.: asst. surgeon, ear, nose, and throat dept., Royal Waterloo Hospital for Children and Women, London.

JEREMY, W. H. R., M.B. Camb., D.O.M.S.: asst. surgeon, West of England Eye Infirmary, Exeter.

LLOYD, J. P. F., M.B. Birm., F.R.C.S.: senior surgeon, Oxford Eye Hospital.

MALLAM, P. C., D.M. Oxfd, M.R.C.P.: physician, Radcliffe Infirmary, Oxford.

PARFITT, D. N., M.D. Lond., M.R.C.P.: medical superintendent Holloway Sanatorium, Virginia Water, Surrey.

PATERSON, A. S., M.D. Edin., F.R.C.P.E., D.PSYCH.: physician for psychological medicine, West London Hospital.

SHARP, H. S., M.B. Camb., F.R.C.S.: asst. surgeon, ear, nose, and throat dept., Royal Waterloo Hospital for Children and Women, London.

The Ministry of Health.—The following appointments are announced:—

Principal M.O.s—

GOOD, C. F., M.R.C.S.
MCINTOSH, T. S., M.D. Edin., F.R.C.P.E.
MACKENZIE, M. D., M.D. Lond. (in charge of epidemiology and international health).
STURDEE, E. L., O.B.E., M.R.C.S., D.P.H.
WADE, T. W., M.D. Lond. (Welsh Board of Health).
WHITTING, R. E., M.D. Camb. (in charge of the Insurance Medical Service).

Senior M.O.s—

BANKS, A. L., M.D. Lond.
BEATTIE, N. R., M.D. Durh.
BRADLEY, W. H., D.M. Oxfd.
DONALDSON, E., O.B.E. M.D. Lond.
DONELAN, C. J., M.B. Lond.
FORD, R. E., M.D. Lond.
GODBER, G. E., D.M. Oxfd.
*GOODMAN, N. M., M.D. Camb.
HOPKINS, W. D., B.A. Camb., M.R.C.S.
HUXTABLE, A. E., M.R.C.S.
KELLY, G. C., M.D. Aberd.
LETHEM, W. A., M.C., M.D. Edin.
MAITLAND, C. T., M.D. Lond., F.R.C.P.
MARSHALL, F. N., M.D. Lond.
MARTIN, E., M.B. Durh.
MURCHIE, FINDLAY, M.B. Glasg.
RAEBURN, H. A., M.D. Edin.
TAYLOR, DOROTHY M., M.D. Edin.
THOMSON, R. O. C., M.B. Edin.

* In absentia.

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PHENYLKETONURIA
A PROBLEM IN EUGENICS*

L. S. PENROSE
M.D. Camb.
GALTON PROFESSOR OF EUGENICS IN THE UNIVERSITY OF LONDON AT UNIVERSITY COLLEGE

FOR academic purposes, eugenics is defined as the study of agencies under social control that may improve or impair the racial qualities of future generations either physically or mentally. This formula allows many different interpretations. The subject matter might involve almost any material studied in medicine, psychology or social science. In the light of knowledge of its frequent misuse, inclusion of the term "racial" in the definition seems unfortunate. A racial quality is presumably any character which differs in frequency or which (when it is metrical) differs in average value in two or more large groups of people. No qualities have been found to occur in every member of one race and in no member of another. Furthermore, as Morant (1939) has shown in his analysis of European populations, differences between average measurements in the so-called races are often much smaller than commonly supposed. The qualities by which people differ can be treated as legitimate material for scientific investigation without employing any invidious concept of race. The human race constitutes the field of eugenic inquiry.

A popular view of eugenics, which has in the past been encouraged by propaganda groups such as eugenic societies and human betterment foundations, implies active interference in human reproduction. The general grounds for interference are often held to be that civilisation has tended to reverse the process of natural selection because the weaklings are now being fostered at the expense of the naturally strong. Not only are the physically and mentally inferior prevented from perishing in infancy by the activities of medical and social services but also, when the weaklings grow up, they are supposed to be more fertile than the normal. As Karl Pearson (1909) once put it, "we have suspended the racial purgation maintained in the less developed communities by natural selection." Degeneration of the physical and mental level of civilised peoples is believed to be inevitable unless eugenic measures are taken to counteract it.

When Galton first proposed the word "eugenics" to describe the science of improving stock, he was evidently influenced by observations on the results of breeding accomplished by animal fanciers with horses and hounds. Applied to man, the object of selective breeding would be, in Galton's (1883) words, "to give to the more suitable races or strains of blood a better chance of prevailing speedily over the less suitable than they otherwise would have had." This appears to imply that eugenics should endeavour to accelerate natural selection between races. A narrow conception of eugenics thus emerged at the outset. I think it is perfectly safe to assume that, if Galton had foreseen the extremes to which ideas concerning "race hygiene" would be taken in some countries, he would not have placed emphasis on the propaganda aspect of the study. A broader view of the aims of eugenics was, indeed, expressed by Galton in his correspondence with Bateson as recorded by Pearson (1930), where a steady though slow amelioration of the human breed was held to be a reasonable objective.

The best antidote to pernicious ideas based upon emotional bias lies probably in spreading knowledge about established facts, but these facts must first be brought to light. Research in the early days of the Galton Laboratory followed the direct method of measuring and recording human qualities without considering the details of their genetic determination. The biological units of inheritance, however, are genes or similar entities and not the visible characters. For some qualities the superficial approach involves no loss of accuracy. If the effects of a set of genes are independent of environment and separately recognisable, like the MM, MN, and NN blood types, or even if their effects are perfectly additive, characters can be used as precisely as genes for eugenic purposes. Recessivity, however, interferes with this ideal situation and reduces the dependence of the character on the gene. In the case of a rare recessive character the correspondence between presence of the gene and presence of the character is very weak. The offending genes are maintained in the population almost entirely by the transmission through normal heterozygotes or carriers. These people carry the gene, but its presence is not manifest. Many rare recessive disabilities have been identified in man, and doubtless many more lie awaiting detection. Not improbably, about two people out of every three are carriers of at least one serious recessive defect. These recessive genes pose a problem which should cause the propagandist of popular eugenics to pause and consider. The early eugenists, as I have mentioned already, feared the loss of the beneficial effects of natural selection. If we are to accept Fisher's (1930) theory of the evolution of dominance, the prevalence of these rare recessive abnormalities is partly the result of natural selection. In any event, it is certain that natural selection has failed to eliminate them. They present a real challenge to eugenic science.

CLINICAL PICTURE

The points raised concerning the aims of eugenics and its relation to natural selection are perhaps most easily appreciated by studying a practical example. Phenylketonuria is a rare disease, first observed by a Norwegian biochemist, Fölling (1934). The essential feature is the urinary excretion of about 1 gramme daily of phenylpyruvic acid, a ketonic acid with the formula $C_6H_5.CH_2.CO.COOH$. The excretion is usually continuous throughout life and has been observed in infancy. Occasional cases showing intermittent excretion have been recorded. Every case so far examined has shown intellectual defect. This is commonly of a severe degree, amounting to imbecility or idiocy. The name "phenylketonuria" (Penrose and Quastel 1937) seems preferable to the original more cumbersome designation "imbecillitas phenylpyruvica" or to "phenylpyruvic oligophrenia," favoured by American workers. The shorter designation emphasises the biochemical nature of the abnormality and brings the nomenclature into line with that of other comparable abnormalities, such as alcaptonuria, cystinuria, and pentosuria.

The *test for phenylpyruvic acid in the urine* is so simple and striking that the failure of clinicians to observe the reaction until so recently is puzzling, except on the basis of the difficulty of obtaining specimens from subjects of low mental grade. When the acid is present, a deep bluish-green, which fades within a few minutes, is obtained on the addition of a few drops of 5% ferric chloride solution. If desired, alkaline urines can first be neutralised by the addition of dilute sulphuric acid. The urine has also a detectable aromatic odour. Naturally, Fölling's discovery stimulated other people to look for cases, and success in this respect was reported first in Great Britain, and then in France, the United States, Switzerland, and Canada.

The clinical picture is peculiar in many ways. To the casual glance these patients appear to be just ordinary imbeciles, but the skilled observer may occasionally diagnose a case correctly before the urine has been tested. Some 60% of the cases are of the idiot grade and 30% imbecile. Most of them are good-tempered, and those with sense enough to learn to talk are coöperative and friendly. In the low-grade cases digital mannerisms, so-called hyperkinetic phenomena, are often conspicuous. Some of the patients, who are severely affected mentally,

* Inaugural lecture delivered at University College on Jan. 21, 1946.

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have epileptiform seizures in infancy, and occasionally the attacks continue up to the age of 9 or 10 years, but I have not known them to occur in older patients. Phenylketonuria has been ascertained more frequently in females than in males, but this difference may be because females are healthier and live longer than the males (table I). There are more females among the ascertained cases in this sample, but more males died in infancy who might have been affected.

Among the main distinctive physical features are dwarfing of stature and reduced head measurements as compared with the normal average. The incisor teeth tend to be widely spaced, and the skin, which may show pigmented patches, is unduly subject to dermatitis. There is sometimes a tendency to excessive sweating. Kyphosis is very common. On the neurological side the constant feature is accentuation of all reflexes, both superficial and deep, in a manner reminiscent of the brisk responses obtained in hyperthyroidism. Abnormal quantities of creatine are excreted in the urine (Pugh 1940). Ordinarily there is no paralysis and no increase in muscular tone, though Jervis (1937) asserts that spasticity is a typical finding. Fair hair and blue eyes are very common characteristics. In some patients the hair is colourless, as in the albino. Comparison of hair colours of the imbeciles with those of their normal brothers and sisters indicates that the fair hair is part of the abnormality, though, as with normals, the colour may darken with maturity. On the whole, the physical health of these patients is surprisingly good, and I know of only two instances of the patient's death in an

TABLE I—AGES OF PHENYLKETONURICS

Age-group	Males				Females			
	CL	CD	PD	Total	CL	CD	PD	Total
60–69	..	..	..	..	..	1	..	1
50–59	1	..	..	1	2	..	..	2
40–49	2	..	..	2	3	..	..	3
30–39	3	..	..	3	7	..	..	7
20–29	8	..	..	8	13	..	..	13
10–19	20	2	1	23	17	..	3	20
0– 9	8	..	17	25	7	1	8	16
Total ..	42	2	18	62	49	2	11	62

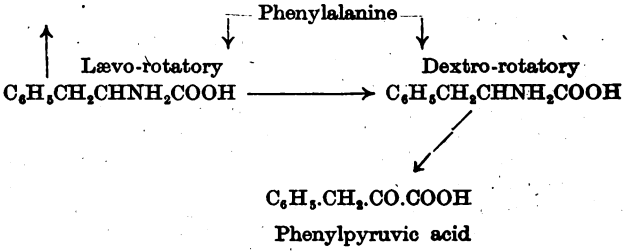
CL, certain cases (living). CD, certain cases (died). PD, possible cases (died).

institution followed by autopsy. In one of these instances I found multiple nerve tumours (Penrose 1939). In another, kindly reported to me by Dr. R. M. Stewart, similar nerve tumours had not been noticed. The patient had died of carcinoma of the thyroid gland. There were numerous small pigmented moles on the skin and one large pedunculated lipoma. The question whether there is a real tendency for phenylketonurics to develop nerve tumours needs further investigation, together with the rest of the pathological anatomy. In both these autopsies, however, the ferric chloride test for phenylpyruvic acid was made on all tissues with negative results.

CHEMISTRY

The pathological chemistry of phenylketonuria has received a lot of attention, but there are many problems here still unsolved. The two main questions are (1) where the phenylpyruvic acid comes from, and (2) how the defect, which allows this abnormal metabolite to be excreted, is related to the associated mental and physical peculiarities. The quantity of the acid excreted depends on the diet. It can be increased by feeding either lævo- or dextro-phenylalanine, and temporarily abolished by a protein-free diet. After a few days of protein-free diet, however, a patient starts again to excrete the acid, which must then be derived from endogenous metabolism. Feeding with excess of amino-acids other than phenylalanine, such as tyrosine and alanine, does not increase the quantity of phenylpyruvic acid in the urine. Thus, it is very probable that phenylalanine, although a common and necessary constituent of ordinary diet, is the source of the abnormal metabolite.

After feeding *normal* subjects on phenylalanine in sufficient quantities, phenylpyruvic acid can be detected in the urine.



Phenylpyruvic acid

A dose of about 15 g. of the lævo variety is needed to produce this result, but 0·5 g. of dextrophenylalanine is sufficient. This may indicate that, normally, lævophenylalanine is changed to dextro in the body and that the dextro substance is then deaminised in the kidneys and liver by the enzyme discovered by Krebs (1935).

Only traces of the acid have been found in the blood of affected imbeciles, but a definitely high concentration of lævophenylalanine is demonstrable. Evidently, in the abnormals, some enzymes capable of splitting the phenylalanine or the phenylpyruvic acid are absent. It is uncertain how far the detrimental effects of this absence are due to poisoning by the excess of phenylalanine and phenylpyruvic acid in the system, or how far they are due to a kind of starvation caused by the inability to build up essential metabolites. The disturbance of reflexes resembling thyrotoxicosis suggests active poisoning, but the lack of pigmentation and of normal physical growth suggests nutritional deficiency. By studying the cerebral blood-supply in phenylketonurics, Himwich and Fazekas (1940) found that their low level of mental activity might be attributed to diminished rate of oxidation.

Animal experiments have led to fascinating results —e.g., those obtained by feeding albino rats on lævophenylalanine. Feeding these animals with the dextro substance always leads to phenylketonuria, as it does in man. In acid solution, however, the lævo substance produces nothing abnormal. In neutral solution it leads to phenylketonuria, but in alkaline solution it produces alcaptonuria (Fölling et al. 1938). Thus, three rare conditions known in man, *phenylketonuria, alcaptonuria,* and *albinism,* have been brought into close chemical relationship with one another. Obviously, this is a field where biochemistry has a great contribution to make towards the understanding of human inheritance. By analogy with work on the genetics of plant pigments, the aid of the biochemist will be needed in sorting out the genotypes and allelomorphic genes.

HEREDITY

Pedigrees of phenylketonuria can be interpreted without much hesitation as demonstrations of the mode of inheritance of a rare recessive mendelian trait. The main features include significant familial incidence, which is practically always confined to brothers and sisters. There is sharp segregation between normal and abnormal members of the family. Cousin parents, also, are frequent. The recessive hypothesis has been further strengthened by calculating the probable magnitude of the familial ratio of affected to normal members in sibships after making due adjustment for mode of ascertainment. The ratio is very close to 1 in 4. Except

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in two families in the United States, cited by Jervis (1937), where the mother was phenylketonuric, parents have been reported to be of about average mental capacity. In the great majority of instances they have been examined and proved not to be excretors of phenylpyruvic acid. In the 56 families of which I have records the parents were all normal; 39 brothers or sisters of propositi were affected and 153 were normal. Five pairs (9%) of the parents were first cousins. Jervis found 5% of the parents of the patients from the United States institutions to be first cousins, and 14% of the parents of the Norwegian patients were first cousins (Fölling et al. 1945). All these percentages are significantly higher than the frequencies of first-cousin marriages in the general populations concerned, which is probably below 1% and may be as low as 0·6%. The summary in table II shows also that, if the initial case discovered in each sibship is set aside, the ratio of affected to normal among brothers and sisters is 129/509 (25·3%), very close to 1 in 4.

Since we are dealing with a defect due to heredity, the problem of controlling the incidence apparently ceases to be a medical question and becomes a matter of pure eugenics. This view, however, is incorrect. There may be methods of alleviating the condition, even

TABLE II—FAMILIES OF PHENYLKETONURICS

Source	Initial cases	Brothers and sisters		Parents		
	Phk.	Phk.	Normal	Phk.	Normal	First cousins
Munro and Penrose (1939)	56	39	153	0	112	10
Jervis (1939) ..	125	72	270	2	248	14
Fölling et al. (1945)	22	18	86	0	44	6
Total	203	129	509	2	404	30

though it is inborn, in a manner analogous to the way in which a child with club-feet may be helped to walk, or a child with congenital cataract enabled to see. Attempts have been made to produce improvement of phenylketonurics by giving them massive doses of thiamine (Bates 1939) because of the known effects of this vitamin in stimulating the metabolism of pyruvic acid. No success has been reported, although lack of this vitamin makes phenylketonuria easier to produce in experimental animals. This does not mean that the possibilities in the field are exhausted. However, consideration of the associated abnormalities, such as small size of the head, might tend to make us cautious about expecting anything like a cure. Easily measurable environmental agencies, such as those connected with maternal age and order of birth, do not appear to be of significance in determining the incidence of phenylketonuria; but there may be undiscovered influences which help to determine the severity of the defect.

If phenylketonuria is viewed as a problem of preventive medicine, there are also difficulties. Two genes are required to produce the condition, one derived from each parent, but we cannot take the same attitude here that we might with regard to some noxious pest and simply ask to have the offending genes exterminated. The frequency of the condition in the general population was estimated by Munro (1939) to be about 1 in 50,000 in the United Kingdom, and by Jervis (1937) to be about 1 in 25,000 in the United States. In Norway the incidence may be a little greater. These incidence frequencies are likely to be approximately correct, because they agree fairly well with the observed proportions of first-cousin parents when the Lenz-Dahlberg formula is applied. The high incidence in Norway may, however, be illusory, because the distribution there was found to be uneven, and there was a tendency for some of the cases to be concentrated in isolated districts where inbreeding was unavoidable. In one small region, Hvaler, a single ancestor possessing the gene might have been responsible for the four certain and two probable cases found there. Judged by institutional surveys, the incidence is high in France (Rhein and Stoeber 1936) and low in Switzerland (Brugger 1942).

The gene frequency, or square root of the incidence, must vary between 1 in 158 in the U.S.A. and 1 in 223 in the U.K.

Survey	*Case frequency* (q^2)	*Gene frequency* (q)	*Carrier frequency* ($2q(1-q)$)
U.S.A. ..	1/25,000 ..	1/158 ..	1/80
U.K. ..	1/50,000 ..	1/223 ..	1/112

The frequency of carriers of the gene is double the gene frequency, because the gene may be on either one of a pair of chromosomes. Hence, the frequency of carriers in this country is of the order of 1 in 100. To eliminate the gene from the racial stock would involve sterilising 1% of the normal population, if carriers could be identified. Only a lunatic would advocate such a procedure to prevent the occurrence of a handful of harmless imbeciles. Sterilisation of the affected imbeciles would do no good, except in the very rare cases where they might be expected to have offspring. The attempt to reduce the frequency of the genes by assuming close relations of affected cases to be carriers and sterilising them necessarily involves many errors. Such a plan would leave far the largest reservoir of genes—that in the general population—untouched.

In spite of the alleged interest taken in the subject of hereditary disease in Germany, no search for phenylketonurics has been reported there. If such a search had been instituted, a curious situation might have arisen; for, up to the present time, no phenylketonuric of Jewish origin has been discovered, though cases of German, Irish, Italian, Slavonic, and Dutch origin were found in the U.S.A. Moreover, there were no cases found among American negroes. This picture, as seen in table III, is a somewhat refreshing change from that

TABLE III—RACIAL ORIGINS OF PHENYLKETONURICS

Origin	Observed percentage of 161 cases *	Expected (1920 census) †	Ratio of observed to expected
Latin	18	4·8	3·8
Slavonic	10	2·8	3·6
Dutch	3	1·1	2·7
Irish	21	10·1	2·1
Scandinavian ..	2	2·4	0·8
German	6	9·0	0·7
English	12	32·1	0·4
Jewish	0	2·3	0·0
African	0	7·4	0·0
Total ..	72	72·0	1·0
Other ..	28	..	..

* Jervis (1939). † Adapted from Burr (1922).

presented by Tay-Sachs disease (the infantile form of amaurotic idiocy), whose incidence is almost confined to Jewish communities. A sterilisation programme to control phenylketonuria confined to the so-called Aryans would hardly have appealed to the recently overthrown government of Germany.

The high percentage of Irish and Italian cases in the American sample is of interest. In his survey of cases in the United Kingdom, Munro (1939) found a rather higher incidence in the west of England than in the east, particularly in the north-west. We had the impression that there were many cases of Celtic origin. The distri-

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bution of the blood antigens, A and B, in phenylketonurics and their sibs showed a higher incidence of B than did the English population from which these cases were drawn, though the incidence of A was not raised. That is to say, these families tended to resemble groups of peripheral Europeans in respect of their blood-group frequencies expressed as percentages:

Sample	*O*	*A*	*B*	*AB*
Phenylketonuria sibships (179) ..	45	39	13	3
England (9000)	47	42	8	3
Northern Ireland (784)	56	30	12	2
Southern Italy (1460)	49	29	19	3

Although we cannot yet say what is the original habitat of this gene, or how often it has arisen by new mutation in more than one place, at least it is proved that it determines a "racial" quality in the technical sense that its frequency differs in different parts of the world.

Before taking any steps in practical eugenics, the effect already produced by natural selection on phenylketonuria should be studied. Out of more than 500 reported cases, only three families are known to have had any offspring (Jervis 1939). Affected persons are, in general, extremely infertile. On the other hand, the families in which cases occur are no smaller than the average size in the community. While nature takes care to eliminate nearly all the genes which occur in homozygous (duplicate) form, she does not eliminate the gene in heterozygous (single) form, where its action is masked by the presence of other genes. If Fisher's (1930) theory of the evolution of dominance is correct, some of this masking of carriers may be actually the result of a natural selection which has encouraged the spreading of genes which tend to alleviate the condition.

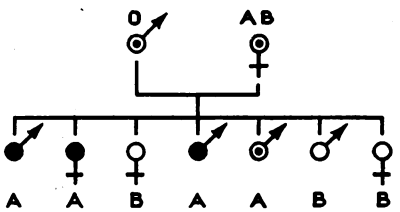
The argument can even be applied to the imbeciles. Not all are equally affected. The degree of mental defect does vary within the families, where more than one case occurs, but there appears also to be some tendency for the grade to be of the same level in the same sibship. On the basis of somewhat limited material I estimate that the correlation of mental grade of affected sibs is of the order of +0·3. This value suggests that differences in mental grade can be due to genetic modifiers. The way in which such modifiers might be supposed to act is shown in a Canadian sibship (Penrose 1945). The parents, of English origin, had 5 living affected children besides 6 normal children. Two of the phenylketonurics were idiots, two were imbeciles, and one was a simpleton or moron with severe juvenile diabetes. The two imbeciles had glycosuria and may have been mild diabetics, but the two idiots never showed glycosuria. Is it possible that the diabetes, which is presumably an incidental condition of genetic origin, in this sibship actually modifies and alleviates the manifestation of the phenylketonuria? The general tendency mentioned earlier for females to be more healthy than males may also be due to selective modification because of the relatively higher fertility of females as compared with males (Penrose 1942).

Reverting to the discussion of the heterozygotes or carriers, we may ask whether there are to be observed in them any traces of the effect of the abnormal gene which have not been blotted out by selective modification? That is to say, perhaps the gene is not perfectly recessive. Observations on families in which phenylketonuria has occurred give, on the whole, very little ground for supposing that carriers are in any way abnormal. However, I have come across several families in the course of my investigations or those of Munro (1939) where depressions associated with persecutory ideas were frequent in close relatives. The mean age of onset of the mental disturbance in 20 members of such families was about 50 years. Fölling, Mohr, and Ruud (1945), in their Norwegian studies, doubt the significance of these findings. The family histories of American cases, however, gave my theory some support, though the mental illnesses found in relatives were all diagnosed as schizophrenia. If there is variation in the degree of manifestation of mental symptoms in the phenylketonuric homozygote, we may expect an even greater degree of variability in any mental symptoms associated with the heterozygous state. However, if the concealment of the gene in heterozygous form is to be attributed to nature, we must admit that in her task she has been, on the whole, very successful.

DETECTION OF CARRIERS

Another line of inquiry is the search for a functional test to differentiate carriers from the normal. At first it seemed as though experiments might demonstrate that the parents of phenylketonurics and other probable carriers had a low threshold of tolerance for doses of phenylalanine or of phenylpyruvic acid as compared with the normal average. Fölling (1934) thought that parents were liable to spontaneous excretion of phenylalanine. It now seems that, if there is any biochemical difference between carriers and the average person, it is very difficult to detect. Perhaps the right test will yet be discovered.

A quite different approach to the problem of detection of carriers is the search for closely linked genes which can serve as markers. Here we are no longer attempting to improve the degree of positive correlation between the character and the gene. The effects of a linked gene can be negatively or positively correlated with those of the abnormal gene. The most straightforward test to make—i.e., that for linkage with genes on the sex chromosome, which can be either partial or complete (Haldane 1936)—gives negative results when applied here. The gene we are concerned with is evidently located upon one of the autosomes. The search for autosomal linkage is an arduous task and requires the coöperation of personnel with a variety of skills. The investigation carried out on the relation of phenylketonuria to the ABO and MN antigens by Munro et al. (1939) occupied about two years merely to cover all the known English cases. Some additional information has been obtained from affected Canadian families. No indication of linkage is discernible between phenylketonuria and MN, but with ABO there may be a relatively weak linkage, with a recombination value of 30%. The accompanying figure shows a family of the type which favours the linkage hypothesis. However, even if this linkage is real, it is too weak to warrant using the ABO blood-groups alone as markers for carriers.



A sibship of phenylketonurics, showing blood-groups. If linkage is complete, normal A sibs must be carriers, and B sibs may or may not be carriers. (Circles indicate normals; central dots indicate carriers.)

EUGENIC PROGNOSIS

The situation at present is, then, that we are for practical purposes still unable to identify carriers. Persons who are related to phenylketonurics, nevertheless, inquire whether they are likely to have affected children, and they must and can be given information.

Let us take the case of the normal brother or sister of a phenylketonuric imbecile. His chance of being a carrier is 2 in 3. Unless he chooses a wife who is a cousin of his or an inhabitant of the Norwegian Hvaler islands, she will have the ordinary chance of being a carrier, and this has been shown to be of the order of 1 in 100. The chance that a child of this union will be affected is,

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therefore, a quarter of two-thirds of a hundred—i.e., 1 in 600. In my opinion, this risk is no adequate ground for discouraging the union.

There is, however, a wider eugenic aspect. Are we justified in allowing the further spread of a noxious gene in the population? Here I think we must accept the inevitable, which is not, after all, very bad. It is obviously unfair to discriminate between one carrier and another regarding which shall be allowed to have offspring and which not, and we cannot reasonably sterilise 1% of the population. The practical medical aim is to reduce the incidence of phenylketonuria. This can be accomplished by preventing consanguineous matings in affected families, and ultimately by preventing all matings of two carriers. These procedures are, paradoxically, slightly dysgenic. Haldane (1939) has calculated that the general tendency in recent years for the degree of inbreeding to diminish in human populations will actually tend to produce a slight increase in the abundance of carriers of most rare recessive diseases. The point is that in the past there has probably been a balance between extinction of genes (through infertility of affected homozygotes) and new mutation. The proposed eugenic practice of discouraging the mating of partners who are both carriers denies, as it were, natural selection its legitimate prey. The argument, however, is contingent on the normal fertility of carriers. Mutation of the gene for phenylketonuria, moreover, is probably not sufficiently frequent to cause any alarming increase in carriers for a long time to come.

ENVOI

I have dwelt at length on the subject of phenylketonuria partly because it is fascinating in itself and partly because it demonstrates many of the problems of eugenics as they appear in the light of recent knowledge. The topic also emphasises the need for close coöperation between the clinician, the biochemist, the serologist and the geneticist. It is impossible for anyone to solve all the problems concerned single-handed. As in other branches of scientific work, groups of experts must be the units of eugenic investigations.

Another attraction of the study of phenylketonuria is its psychiatric implications. The general problem of mental health is among the most important problems confronting the human race. We do not, in civilised communities, willingly entrust persons judged to be insane or mentally defective with dangerous weapons, such as knives and firearms. Now that weapons are constructed capable of instantaneous annihilation of large populations, the question of ensuring the intelligence and mental stability of people entrusted with power of decision has become extremely significant. Failure in the psychiatric field could make the other most elaborate plans for improving the human race quite valueless. Up to now the contribution of human genetics to the study of psychiatry, except in Huntington's chorea and other uncommon neurological conditions, has been vague and often misleading. In phenylketonuria we have an instance where a detectable chemical deviation is associated with abnormal mental function. The discovery raises two important questions: (1) whether some other types of mental illness will not be found to have hereditary biochemical backgrounds, and (2) how far the course of such illnesses, when identified, can be influenced by the deliberate alteration of body metabolism.

Progress in knowledge of the hereditary factors involved in mental diseases has been greatly hampered by lack of accurate methods of discriminating one type of disease from another. Until other conditions can be specified with an accuracy approaching that which has been obtained in phenylketonuria, eugenic prognosis in the field of mental illness will remain, in most instances, a surmise based upon personal bias rather than a scientific judgment.

(*References at foot of next column*)

PAIN OF ORGANIC DISEASE RELIEVED BY PREFRONTAL LOBOTOMY*

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AMONG the 400 patients with mental disorders whom we have treated by prefrontal lobotomy a considerable number have had unbearable pain as the outstanding complaint. We felt justified, when the pain disappeared after lobotomy, in speaking of the relief of mental pain (Freeman and Watts 1942b). In these cases the complaints of pain appeared excessive and out of proportion to the local condition found on examination. It was equally obvious that we were dealing with people who suffered greatly from anxiety, nervous tension, depression of spirits, and fear of the future. To them the sensation was more than pain; it was pain coloured by their gloomy outlook and by the supposed consequences of the pain. Every time the sensation was felt, it meant that something was going to happen or was in process of happening that meant more suffering to come. Sometimes the pain became symbolic of the torment and suffering that the patient recognised as the consequence of previous acts which still aroused feelings of guilt.

It seems that when the emotional component is reduced, when the feelings of guilt, the regrets for the past, and the fears for the future are abolished, the sensations no longer have the same meaning for the patient. We recall an emaciated middle-aged woman who had complained of pain in the back of 28 years' duration. Her stomach "went into knots" on the slightest provocation. During the operation under local anæsthesia the patient complained bitterly about her back and her stomach, but paid little attention to what the surgeon was doing. While conversing with her, the neurologist laid his hand lightly upon her scaphoid abdomen and could feel a freely movable mass, probably the pylorus of a greatly ptosed stomach. The patient objected to this and begged him to remove his hand. As the surgeon severed the final quadrant in the frontal lobe, the complaints disappeared and with them the palpable mass. In the year that has elapsed since the operation the patient has increased from 5 st. 9 lb. to

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more than 7 st. 2 lb. and has never again complained of either her back or her stomach.

Prefrontal lobotomy relieves anxiety and emotional tension in rather specific fashion. It diminishes concern over consequences. It eliminates the fear of pain. Pain may be present; but, when it no longer arouses a mental picture of future disability and all that this may mean in terms of disaster to the person and his family, the experience can be borne with equanimity. Consequently, prefrontal lobotomy lends itself well to the relief of conditions in which the affective component of a painful disorder is equally important with the local condition.

Prefrontal lobotomy has not been used to any considerable extent for the relief of pain in non-psychotic patients. Usually when medical measures fail to bring relief the surgeon has severed nerves or spinal roots, resected part of the sympathetic system, or, in extreme cases, has performed anterolateral chordotomy or even mesencephalic tractotomy. Sometimes such operations have been gratifying in the extreme, but sometimes they have brought no relief. De Gutierrez-Mahoney (1944) has resected the postcentral gyrus for the relief of persistent pain, but VanWagenen is the only one to our knowledge who has performed prefrontal lobotomy for this purpose. The observation is unpublished but concerns a patient who suffered pain in a phantom limb that defied multiple amputations; the relief was complete.

We report here our experiences with prefrontal lobotomy in the relief of pain from recurrent carcinoma, tabes dorsalis, thalamic syndrome, trauma to the cauda equina, and hysterical contractures.

CASE-RECORDS

CASE 1.—A white man, aged 45, developed carcinoma of the rectum in 1942, which recurred in 1944 with severe pain in the perineum and down both legs. Anterolateral chordotomy was performed on both sides, with the production of analgesia on the right side but not on the left. In spite of this the patient continued to suffer severe pain on both sides. Metastases developed in liver and lungs, with a great deal of abdominal pain, which could be controlled only partially with morphine every three hours.

The patient suffered constantly and could not eat or sleep with comfort. His anticipation of pain was also pronounced. Even as he was being given a hypodermic he would say "When the effect of this morphine wears off, you won't let me suffer, will you, doctor? You'll give me another hypo, won't you?" He begged the nurses to give him something for his misery, saying that he was going to die anyway and might at least be given comfort. The emotional reaction to pain in this case seemed to be of such great significance that prefrontal lobotomy was proposed to him, and he accepted it with relief: "Anything you can do to ease this pain will be a blessing."

Prefrontal lobotomy was done on April 27, 1944. After operation the patient was dull and confused for a brief period but acknowledged his comfort and no longer demanded morphine. In fact very little sedation was required, and for a period he could eat and sleep better. With the progress of the disease the liver became more and more enlarged, until it practically filled the abdomen. So long as the patient was not disturbed he voiced no complaints; but, if he was moved or a hand was placed on his abdomen, he grimaced with pain. The analgesia to pinprick was exactly as it had been before the lobotomy. His reaction to the inevitability of death seemed to be altered. Asked if he knew he was going to die, he replied: "Sure, everybody has to die, don't they?" This fortitude in the presence of pain and impending death continued until his death on Aug. 1, 1944.

CASE 2.—A white man, aged 50, had been under treatment for tabes dorsalis since 1934. He had undergone malaria treatment and protracted chemotherapy thereafter, with the result that the spinal fluid had become entirely normal. Nevertheless the pains persisted.

The patient was of a rather worrying type, thin, restless, and anxious. He made a good income from driving a taxicab, but had to spend as much as $60–$80 a week for morphine injections, which gave him the only relief he could secure. So long as he remained completely quiet at home the pains did not bother him, but any activity seemed to excite them. Here, again, anticipation of pain seemed to be the disabling factor in his condition. "I guess I could stand the pains if it weren't for the thought of them coming on." Domestic difficulties were also a source of distress to him, and prevented earlier carrying out of the proposed operation. Meanwhile one of his comrades in suffering, also a tabetic, committed suicide. The patient's family finally consented.

Prefrontal lobotomy was done on Dec. 4, 1944, and narcotics were then discontinued. He continued to have attacks but described them as twinges and never complained about them. Because of the domestic situation and his inability to care for himself adequately he was admitted to St. Elizabeth's Hospital, where he is making himself useful to other patients in the ward.

In the year that has passed since operation he has gained considerably in weight, but the signs of tabes are as obvious as ever. His perception of pain is as keen as before, but his reaction to pain lacks the emotional component that was disabling. His euphoria is decreasing, his sense of responsibility is growing, and he is allowed out of the hospital on extended visits.

CASE 3.—A white woman, aged 55, red-headed, with a corresponding disposition, had had rheumatic fever with resulting mitral stenosis in childhood. Embolism of the right renal artery occurred in 1932, with recovery after nephrectomy. In October, 1939, she had cerebral embolism, with resulting paralysis of the left side. Recovery was gradual, but six weeks after the stroke she began to have disagreeable pains centred in the left side of the neck and running down into the fingers. The pains were aroused by any muscular activity and particularly by emotional outbursts, which were fairly frequent. They quieted down during relaxation and did not interfere with sleep.

Examination showed weakness and spasticity of the affected limbs, with hyperextensibility of the fingers. Pinching, scratching, and chilling with ice were unendurable. There was loss of the sense of position in the fingers. Since the arm could not be manipulated without provoking the hyperpathia and arousing emotion verging on rage, this patient had to live in very secluded fashion.

After more than two years' ineffectual treatment, prefrontal lobotomy was done on June 16, 1943. For the first two days she was drowsy and unresponsive; then she developed abdominal rigidity and distension, and winced and cried out when the lower abdomen was palpated. She permitted manipulation of the left arm, and reacted only mildly to scratching and the application of cold. Death took place, on the fourth postoperative day, from peritonitis due to a ruptured diverticulum of the sigmoid.

Examination of the brain showed the surgical lesions opposite the genu of the corpus callosum filled with clotted blood and friable material. The old infarct destroyed the bulk of the putamen and caudate nucleus, sparing the insula, thalamus, and globus pallidus. In the thalamus, however, the centrum medianum on the right side was completely atrophic; the nucleus ventralis anterior and anterolateral parts of the nucleus medialis dorsalis showed moderate degeneration; and the dorsolateral part of the nucleus ventralis lateralis was partly degenerated. The right pes pedunculi was small and in its medial portion showed well-marked degeneration.

This patient did not survive long enough to test adequately our theories about the relief of central pain by prefrontal lobotomy, but the immediate result, so far as reaction to manipulation of the painful limb was concerned, was highly suggestive.

CASE 4.—A white woman, aged 50, had intolerable pain and burning on urination, with vesical tenesmus day and night, reducing her to a trembling weeping invalid. The pain had developed after an operation for prolapsed intervertebral disk during which there was accidental trauma to the roots of the cauda equina. Local procedures, such as re-exploration and removal of more tissue from the disk, resection of the presacral nerve, repeated injections of procaine into the tissues about the neck of the bladder, and intraspinal injections of thiamine chloride, produced no relief. No local cause for the pain was ever discovered, and neurological examination disclosed no abnormalities of muscle power, reflexes, or sensibility.

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After more than a year, during which the only relief obtained was by increasing doses of morphine, prefrontal lobotomy was done under local anæsthesia. At first a minimal operation was done, severing only the fibres in the vicinity of the fasciculus cinguli, with the result that the complaints ceased on the operating-table. They returned within two days, however, and a week later, at a second operation, fibres were severed in all four quadrants in the frontal lobes, with permanent relief of pain.

This patient has been followed for nearly two and a half years and, though she has presented many disagreeable personality features, she has made no complaints of pain. When she was asked about the pain shortly after operation, she replied: "Sure. It's exactly like it was before." "But you don't complain any more," we suggested. "What's the use," she answered, "I can't do anything about it, so it doesn't do any good to complain."

This patient has gained 3 st. 13 lb. and has needed no narcotics since her lobotomy, but interviewed recently she stated that, though she felt no pain, "every drop of urine felt like a barrel." There is moderate urinary frequency, about which the patient makes facetious remarks, but her distress vanished at the time of operation and has never recurred.

CASE 5.—A white woman, aged 44, was first seen in November, 1936, after she had spent two years in bed because of "arthritis." There was moderate lipping of the vertebræ but no other significant changes. However, the patient complained so bitterly and was so apprehensive that it was impossible to make any headway in treatment. She had a long history of abdominal operations for adhesions, maybe a dozen in all, and was of subnormal intelligence and hysterical temperament.

Prefrontal lobotomy was carried out by the Egas Moniz technique on Nov. 30, 1936. Within three days the patient permitted manipulation of the limbs. She winced and cried out when the knees were straightened, and the crepitus was very considerable; but, instead of shrieking with apprehension and refusing to coöperate, she showed interest and willingness to help in the efforts that were made to aid her. On the fourth postoperative day she walked with assistance; and next day, on attempting to walk unassisted, she fell and sprained her ankle but nevertheless kept on walking. Her whole reaction to pain seemed to have been altered in that the fear of being hurt no longer upset her emotionally.

It is now nearly ten years since her lobotomy was done, and she has supported herself in adequate fashion in a bookbinding works. When she is asked about her sensations she puts on a long face and tells how terribly she feels, how much her back hurts, how she can hardly walk; and yet she never complains of these sensations to members of the family (Freeman and Watts 1942a).

SUMMARY

Five cases are reported in which prefrontal lobotomy was performed for the relief of pain which had proved refractory to other methods of treatment. In all cases the pains were severe, constant, and disabling, and there was a considerable structural basis for them; yet the emotional component, the emotional response to the pain, seemed to be more disabling than the pain itself.

Previous observations had indicated that, when unbearable pain (psychalgia) is one of many symptoms of a mental disorder, prefrontal lobotomy relieves the pain along with the nervous tension and other emotional manifestations.

The present cases indicate that, when pain due to organic disease becomes unbearable and the fear of pain becomes as dreadful as the pain itself, prefrontal lobotomy is a desirable procedure.

Psychosurgery alters the subject's reaction to pain without materially changing his ability to feel pain. Pain may be present, but when divorced from its implications—insecurity, disability, guilt, death—it then becomes bearable and may be accepted with fortitude.

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LABORATORY DIAGNOSIS OF WEIL'S DISEASE

SIX YEARS' OBSERVATIONS

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THE serological diagnosis of Weil's disease, though relatively simple, is not undertaken by most general laboratories, owing to the special experience required for the maintenance of suitable strains of *L. icterohæmorrhagiæ* and for the making of reliable agglutinable suspensions.

For this reason this department has undertaken the diagnosis of the leptospiroses for the Emergency Public Health Laboratory Service since its inception in 1939. In addition to sera obtained through the E.P.H.L.S. many have been sent to us privately. In the six years Jan. 1, 1940, to Dec. 31, 1945, we have examined 1120 human sera, of which 182 have agglutinated a suspension of *L. icterohæmorrhagiæ* in dilutions up to and greater than 1 in 400, the majority having a higher titre than 1 in 1600. A sufficient number of the sera were accompanied by useful occupational or clinical data to make it worth while to review the experience of these six years in relation to the occurrence of leptospirosis in this country and its serological diagnosis.

METHODS

The technique adopted throughout for the serum titrations has been a macroscopical tube-agglutination method using formolised serum-water cultures of the organism, developed independently in this laboratory, though first described in principle by Schüffner (1934). In the earlier part of the period no great difficulty was experienced in making stable durable suspensions in bulk, sufficient to last the whole period under review, but failures have lately been so common that it has been necessary to revert to living suspensions. A new rapid microscopical method, which will be described elsewhere, has been used for this purpose. For the cultivation of the leptospiræ it was found by trial and error that a simple solution of 12% rabbit serum in glass-distilled water was most satisfactory. (Copper-distilled water will not do, probably owing to minute amounts of the metal being lethal to the organisms.) A heavy inoculum is necessary, and incubation must be carried on at 30° C for 4–5 days, by which time the suspension is usually of sufficient density for our purposes. When permanent killed suspensions are required, the organisms are then killed with 0·25% formalin. By this method positive sera gave a visible result after an hour in the 37° C water-bath, the final titre being reached by allowing to stand at room temperature overnight.

The "Jackson" strain of *L. icterohæmorrhagiæ* was used up to July, 1944, and subsequently the strain "Wijnberg." This change was necessitated by the dying out of the Jackson strain. Suspensions of both strains gave satisfactory results with known positive human and animal sera. In the diagnostic test sera yielding titres of less than 1 in 400 have not been included among the definite positives; but when they have been encountered a request has been made for a further specimen, and in most cases the titre has either shown a great rise, clinching the diagnosis, or has remained steady or fallen, indicating absence of the infection.

EPIDEMIOLOGY

Seasonal and Occupational Incidence.—The monthly incidence of positive serological reactions tested in this laboratory is shown for individual years in fig. 1. A compilation of the monthly totals over the whole period under review is presented graphically in fig. 2. Of 1120 human sera examined, 182 (16%) gave positive serological evidence of Weil's disease. Occupational and some other relevant information was provided in 149 out of the 182 positive cases.

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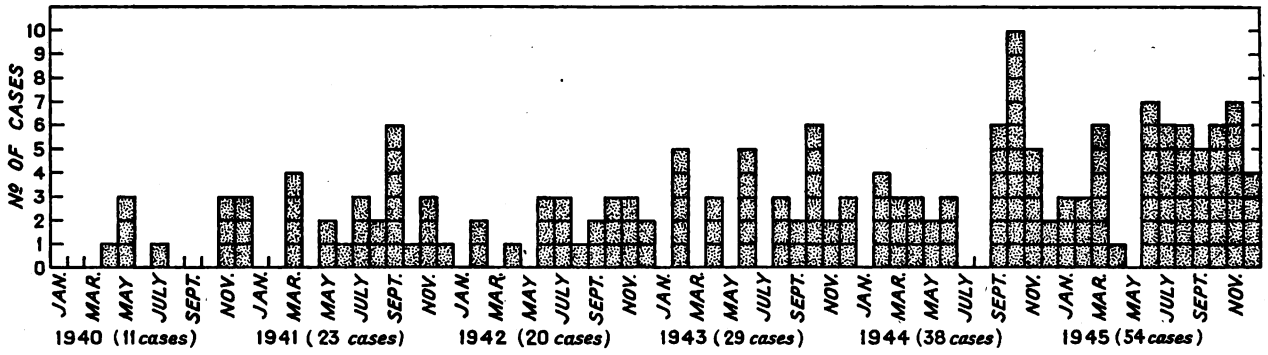

Fig. 1—Seasonal incidence of Weil's disease for separate years.

Our data are derived from cases occurring in all parts of Great Britain; and, though they are not comprehensive, no particular section of the community has been selected. Both military and civilian cases have been included. As the availability of the diagnostic service became more widely known, greater use has been made of it. The progressive increase in numbers of specimens examined year by year is shown in fig. 1.

It is to be regretted that in most cases inadequate clinical data accompanied the requests for investigation, so it has been impossible to assess the frequency of the diagnosis of the anicteric form of the disease. All recent reviews of Weil's disease—Schüffner (1934) and Walch-Sorgdrager (1939) in the Netherlands, Borgen and Thjøtta (1941) in Norway, and Gardner (1943a) in England—have emphasised the importance of recognising the disease in its anicteric phase, beyond which a large proportion of the cases do not develop. The proportion of serologically identified cases which never develop jaundice is given variously by these writers as between 40 and 60%, and the proportion would no doubt be even higher if the aid of this test were invoked in more cases of pyrexia of obscure origin in circumstances associated with exposure to rats or their excreta.

The occupational or casual incidence of infection obtained from the data at our disposal was as follows:

Occupation, &c.	*No. of cases*		*Occupation, &c.*	*No. of cases*	
Colliers	27	(18·0%)	A.T.S.	2	(1·3%)
Farm workers ..	13	(8·6%)	Naval personnel	4	(2·7%)
Bathing and accidental immersion ..	12	(8·0%)	R.A.F.	3	(2·0%)
Sewermen	6	(4·0%)	Italian prisoners-of-war	5	(3·3%)
Butchers	5	(3·3%)	Miscellaneous or unknown ..	45	(30·2%)
Fishworkers ..	2	(1·3%)	Total ..	137	
Male Army personnel	13	(8·6%)			

The monthly distribution of the cases in the occupations of collier and of farmer and in immersion, the commonest type of casual exposure to infection, is shown in fig. 3. Among colliers and farmers the cases are widely distributed throughout the year without a well-defined peak of incidence at any time, but bathing gives a peak incidence in the summer. The high incidence of Weil's disease among coalminers confirms the experience of earlier workers (Buchanan 1924, 1927, Alston and Brown 1935). Sewermen provide a moderate number of our positive cases; this occupation has long been recognised as one in which the risk of contracting Weil's disease is high (Inada et al. 1916, Fairley 1934).

Of particular importance is the relatively high proportion of cases which can be attributed directly either to bathing or to accidental immersion in water polluted with rats' urine. This cause has been recognised and repeatedly emphasised by workers in Holland, where there are numerous stagnant waterways. The rise in incidence of Weil's disease in the summer among people not habitually exposed to infection through their occupation is certainly due, in part if not principally, to infection incurred in this way. Most canal and river banks are infested with rats, and the importance of this channel of exposure can, in our view, scarcely be overestimated.

Anybody with a recent history of bathing or involuntary immersion who develops malaise, myalgia, and headache should be considered as a possible case of Weil's disease, and an agglutination test should be done at once. One patient in this series was infected apparently while sea-bathing. We have no data regarding the survival of leptospiræ in sea water, but a possible explanation might be the existence of a nearby sewer outlet.

Case-to-case infection in Weil's disease is rare; Doeleman (1932; cited by Walch-Sorgdrager 1939) described an instance of transmission by sexual intercourse, and Weil's disease in a husband and wife also occurred in our series, but we cannot say whether or not this was an example of venereal transmission.

A high proportion of our positive cases occurred among farm labourers, as might be expected because rats often infest farm buildings and the labourers are often exposed to potentially infected water. It seems that leptospirosis is a diagnosis to be borne in mind when dealing with agricultural workers; and, in view of the inevitably less efficient medical services in country areas, medical officers of health would be well advised to draw attention to the possible occurrence of Weil's disease, so that serum treatment or chemotherapy can be begun as soon as the diagnosis is established.

Butchers and fishworkers comprise a moderate proportion of our cases, and both occupations are well recognised as entailing a risk of leptospiral infection (Davidson et al. 1934). In the miscellaneous group occasional cases have occurred among flaxwashers, bargees, and storekeepers.

We have had no laboratory infections, but two cases of minor illness, with pyrexia, headache, and anorexia, which gave positive agglutination reactions, developed among the personnel of this institute, one following accidental immersion in the Cherwell, and the other probably as a result of handling material contaminated with

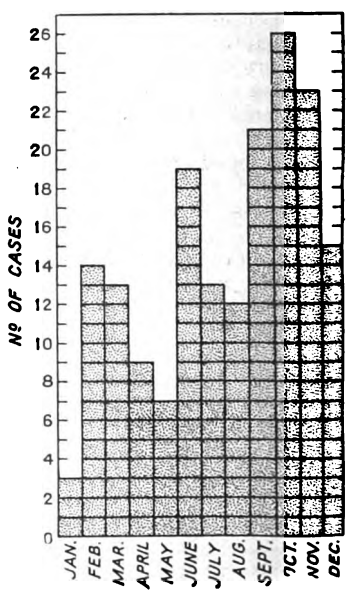

Fig. 2—Combined seasonal incidence 1940-45.

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rats' urine on the banks of that river. Both these cases were anicteric and benign in their clinical course, and but for the awareness in this laboratory of the likelihood of Weil's disease the diagnosis would almost certainly have been overlooked.

From the results outlined here it is clear that Weil's disease may occur at any time of the year, but that it is particularly to be expected in the autumn after a sharp rise in the summer (fig. 2). Among those exposed to infection by virtue of their occupation the disease is often contracted in February and March. The reasons for this subsidiary peak in the incidence curve are obscure; it may be an epidemiological reflection of the rural adage "February filldyke."

In addition to those cases which have been diagnosed by us, an attempt has been made to discover how many cases of Weil's disease have been diagnosed in laboratories in Great Britain during the years 1940–45 inclusive; and our thanks are due to the bacteriologists and medical officers named in the accompanying table for the information they have given. The total represents at least approximately the sum of all cases so diagnosed during the period. One may guess that many mild or anicteric infections have escaped diagnosis.

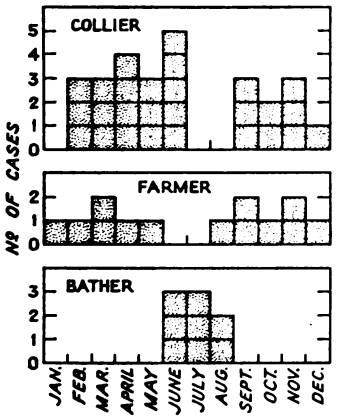

Fig. 3—Occupational incidence and that due to bathing or accidental immersion.

Age- and Sex-incidence.—In 157 cases the sex of the patient was stated, and in this series 10 (6·4%) females gave positive results. This low incidence emphasises the occupational character of the infection. The incidence of positive sera at the two ends of the age-scale was as follows:

Age (years)	*No. of cases*	*Females*
0–10	3	1
10–20	8	0
Over 60	10	2
Total	21	3

The age- and sex-incidence in this series conform with the epidemiological findings of other investigators, females and those at the extremes of age contributing only a small proportion of the cases.

Case-mortality.—We have evidence of the death of 16 serologically established cases, yielding a fatality-rate of 8·8%. This is clearly a minimal figure, since others may have died without our knowledge. It is slightly less than the rate quoted by Walch-Sorgdrager (1939) reviewing the period 1929–37 in the Netherlands, where 808 cases occurred with 76 deaths (9·4%), though it is probably higher than the true value, which could be calculated only if all anicteric and mild cases were recognised. The trend in our series seems to be in this direction, since among the first 50 positive cases which we diagnosed at least 7 were fatal (14%), whereas in the last 132 cases only 9 deaths (6·8%) were notified to us.

The history of medicine repeatedly shows that, as a disease becomes more widely recognised, the case-mortality originally ascribed to it proves far too high. Weil's disease is no exception.

CANINE LEPTOSPIROSIS

Besides the human sera sent to us for examination, we received two specimens obtained from dogs which had developed fatal jaundice. Both sera agglutinated a suspension of *L. icterohæmorrhagiæ* in high dilution. One dog had been bitten by a rat, and the other was a pet of a professional rat-catcher; thus in both there was intimate contact with the most common reservoir.

L. icterohæmorrhagiæ was first identified among dogs in this country by Okell et al. (1925), and Gardner (1943b) described a canine strain of leptospira, transmissible to man, serologically distinct from *L. icterohæmorrhagiæ* and *L. canicola*. The latter organism has been implicated in human leptospirosis on the European continent and occasionally in America (Ashe et al. 1941), but up to the present not in Britain.

OTHER DIAGNOSTIC METHODS

Though our principal diagnostic work has been serological, we have repeatedly been asked to undertake other diagnostic tests for leptospirosis: blood-culture, dark-ground examination of blood and urine, and guinea-pig inoculation. Almost without exception these manœuvres have been unsuccessful. This is in part due to postal delays in the arrival of the specimens; but, owing to the poor viability of leptospiræ outside the body, these measures even in the most favourable circumstances are less often successful than the titration of antibodies.

Where clinicopathological data have been provided, the blood-urea level has been raised, in many cases greatly. Evidence of renal damage should be sought in all suspected cases. Recent experimental work done in this laboratory indicates that, at all events in the experimental animal, the renal lesion develops early and is a constant feature of the pathology in contrast to the variation found in the degree of hepatic involvement (Wylie 1946). Our data and several recent clinical descriptions suggest that in the human disease also too much emphasis has in the past been laid on the hepatic aspect of this syndrome (Senekjie 1944, Bulmer 1945, Hutchison et al. 1946).

Satisfactory as the agglutination test is for the diagnosis of Weil's disease after about five days, it does not adequately cover the very early stages, and even after the fifth day an equivocal result may occasionally be obtained in fulminating cases, where the antibody production is deficient or absent.

Sheldon (1945) has drawn attention to the lesions of striated muscle in leptospirosis icterohæmorrhagica which were first described by Pick (1917). Loss of striation and vacuolation of the fibres occur early in the disease, and Sheldon has suggested the use of muscle biopsy as a diagnostic aid. One of our cases was provisionally diagnosed in the earliest stages by this method, an unequivocal result of the agglutination test not developing until two days later.

CASES OF WEIL'S DISEASE SEROLOGICALLY DIAGNOSED IN 1940–45 INCLUSIVE

Where diagnosed	Informant	Cases diagnosed	Tests done
Oxford	Gardner and Wylie	182	1120
Wellcome Research Inst.	Dr. I. C. Broom	151	646
Glasgow City Public Health Dept.	Dr. R. D. Stuart	79	..
Aberdeen University	Dr. J. Smith	63	379
Northern Ireland	Dr. J. A. Boycott	7*	..
East Everleigh	Lieut.-Col. Buckland, Major J. F. Wilson	3	32
Dundee	Prof. W. J. Tulloch	3	41
Total	..	488	..

*These cases, and 5 in Gardner and Wylie's total, being from Northern Ireland, should strictly not be included in a total for Great Britain. Since this paper was written 3 cases have been added by Prof. T. J. Mackie of Edinburgh.

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OTHER LEPTOSPIROSES

In a few instances, where infection with a European or an oriental strain seemed likely from the history, the serum has been tested against the appropriate formolised suspensions, our parent living cultures having died out, but in no case was a positive result obtained. Buckland and Stuart (1945) described 3 cases of mud fever (*L. grippotyphosa*) among British troops in France, but so far it has not been reported from Great Britain.

SUMMARY AND CONCLUSIONS

It is apparent from the experience of the past three years that Weil's disease is neither a rare malady nor a negligible cause of disability. Infection may take place at any time of the year but is most common in the late summer and autumn. The occupational risks are for the most part well recognised, but the high incidence among farm workers should be emphasised with a view to prompt diagnosis, since serum and chemotherapy, if at all effective, are probably only so if administered early.

Of the casual causes of infection by far the most important appears to be bathing in water polluted with the urine of rats, especially sluggish rivers and canals. Weil's disease should be considered at once in cases of pyrexia with a recent history of bathing or accidental immersion.

If early diagnosis can be improved in cases of pyrexia of unknown origin, it is probable that the incidence of the anicteric form of Weil's disease will be found to exceed 60% of the total cases, and that the case-mortality of the disease is really lower than the figures given in this and other reviews.

Mention has also been made of 2 fatal cases of leptospirosis icterohæmorrhagica in dogs.

We wish to thank those who sent us sera, and hope that they will continue to do so, but that in future their requests will be accompanied by more occupational and other relevant data.

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SUBACUTE HEPATIC NECROSIS TREATED WITH METHIONINE

A SUCCESSFUL CASE

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IN August, 1945, an airman developed a severe attack of infective hepatitis, with massive œdema and ascites as a late complication. The case is reported because of the dramatic diuresis and subsidence of ascites and œdema following the use of methionine.

An airman, aged 24, acquired gonorrhœa in June, 1945, for which he received routine penicillin injections. About Aug. 12 he began to have lassitude, anorexia, and occasional vomiting. His urine became dark and his stools pale, and jaundice appeared. He was admitted to sick quarters on the 19th. The jaundice persisted, and his vomiting became troublesome. He was therefore transferred to a R.A.F. hospital on Sept. 24.

On admission he was very icteric, his abdomen was slightly distended, and his urine contained much bile. He was rational, and the liver was not palpable. Next day his temperature rose suddenly to 102° F, and the jaundice and distension became worse. On the fourth day from admission mental confusion appeared, and became pronounced on the fifth day, with incontinence. He then began to improve, and on the seventh day he was rational, and the jaundice had lightened a little.

The temperature fell to normal by Oct. 14. Meanwhile œdema of the legs and back and demonstrable ascites had appeared on Oct. 8, and a few days later had become gross.

Three plasma-protein estimations gave figures below the critical level for œdema (5·5 g. per 100 c.cm.): 4·5, 4·25, and 5·0 g. per 100 c.cm. Urine contained much bile, a trace of albumin, and occasional hyaline and granular casts. Hb fell at first—100%, 86%, 75%, 70%—but rose after blood-transfusion to 88% on Oct. 15.

He was given a high-protein low-fat diet and glucose and alkalis by mouth. Glucose was given intravenously while he was irrational. He was given 2 pints of blood on Oct. 8 and 2 pints of plasma on Oct. 12. Fluid was removed from the abdomen by paracentesis: 10 pints on Oct. 10 and 13 pints on Oct. 22. He had a slight relapse of the infective process on Oct. 19, the temperature rising to 101° F and diarrhœa and abdominal discomfort appearing. The temperature was normal again by Oct. 24.

The recovery phase of his illness must be described from Oct. 20. He was then given mersalyl 1 c.cm. every third day and 'Anahæmin' 2 c.cm. twice a week. On the 23rd methionine 5 g. daily by mouth was started. The average daily output of urine for the week before the first dose of mersalyl was 26 oz., the maximum being 32 oz. In the twenty-four hours following each of the first three injections of mersalyl there was a slight increase in excretion, the maximal output in twenty-four hours being 72 oz., the average for the week being 39 oz.

On the 30th, seven days after starting methionine, a massive diuresis began and continued for eight days, the maximal daily output being 255 oz.; and the average 182 oz. The œdema and ascites as rapidly and dramatically disappeared. Three subsequent plasma-protein estimations gave the figures 5·75, 5·5, and 5·25 g. per 100 c.cm. A total of 50 g. of methionine was given in ten days. Mersalyl injections were continued for four weeks and anahæmin for five.

He was discharged on Dec. 18. His general condition was satisfactory. Jaundice, œdema, and ascites had disappeared; the liver edge was just palpable. The blood van den Bergh was 2·5 units. Liver-function tests gave results at the lower limit of normal.

We believe that this case is an example of syringe-transmitted hepatitis followed by subacute hepatic necrosis, which led to a defective formation of plasma proteins. The œdema and ascites are thought to have been caused by this, five out of six plasma-protein estimations being entirely consistent with this explanation. We cannot ascribe them to renal or cardiac causes or to anæmia. The prompt relief of œdema and ascites following the use of methionine appears to support the suggestion made by Himsworth and Glynn [1] that certain cases of toxipathic hepatitis are complicated by a "conditioned" deficiency of methionine. We realise that we have not proved that recovery was due to the methionine, because such cases sometimes recover spontaneously, and the other forms of treatment, such as the blood-transfusions, may have contributed to the result.

Our thanks are due to the Director-General of the R.A.F. Medical Branch for permission to publish this case.

1. Himsworth, H. P., Glynn, L. E. *Lancet*, 1944, i, 457.

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"BURNING FEET"

IN BRITISH PRISONERS-OF-WAR IN THE FAR EAST

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THE purpose of this paper is to describe peculiar pains in the feet which developed in Allied prisoners-of-war in Japanese camps, probably owing to vitamin deficiency. In some cases the symptoms were accompanied by retrobulbar neuritis.

On March 8, 1942, large bodies of Allied troops capitulated to the Japanese in Java. Half of the British personnel were R.A.F. men evacuated from Malaya; the remainder were units direct from the Middle East and the United Kingdom. The nutrition of the latter was excellent. The former, fresh from the Malaya campaign, cannot have been in a state of optimal nutrition, but at the time of the capitulation there were no obvious signs of malnutrition; apart from the wounded and a minority with indigenous diseases, the health of the mass was excellent.

The prisoners were herded into barracks, gaols, and coolie lines. There was gross overcrowding, and sanitation was bad. Work was light at this stage, in contrast to the later labour policy, when men were worked and starved to death.

Signs of vitamin deficiency, such as pellagra and ariboflavinosis, developed after four months—in July. In the initial period, before the development of vitamin deficiency, malaria and dysentery were common. The incidence of malaria was 20%, with frequent relapses. Mild but extensive outbreaks of bacillary dysentery occurred, but severe cases and chronic diarrhœa were rare. Tropical skin diseases and infestations were common, and there were many cases of venereal disease. We investigated the question whether the preceding malaria and dysentery could influence the development of the food-deficiency diseases but did not find any relationship.

THE DIET

The diet was deficient in protein, fats, vitamins, and mineral salts, and was of low calorie content. During the first four or five weeks, before the Japanese had organised their commissariat, the food consisted solely of poor quality rice; 350 g. of polished rice and a few ounces of watery stew were issued daily. The result of this sudden change of diet was a series of functional upsets. Weight was rapidly lost, especially in the obese. One felt weak and hungry. Blood-pressures dropped sharply, 100 mm. Hg systolic being quite usual. "Blackouts," especially on standing up suddenly, and bouts of dizziness were common. Nocturnal frequency of micturition was almost universal, some unfortunates micturating from six to eight times nightly. This initial phase lasted four or five weeks, after which there was some improvement in the rations, and concurrently feelings of weakness and hunger became less, weights stabilised, and blackouts diminished, though nocturnal frequency and hypotension persisted.

The scale of Japanese rations, when first published, was as follows:

Polished rice	400 g.	About 2000 calories
Vegetables	200–250 g.	
Meat	50 g.	
Bread	50 g.	
Coconut oil	10 g.	
Salt	5 g.	

This was the official issue. In practice the 50 g. of meat was half bone and gristle. This gave a flavour to the vegetable stew, and an occasional small piece of meat might be discovered in the course of a meal. The vegetables were of poor quality and included Chinese cabbage, Chinese radish, brinjals, yams, and spring onions. The quantities varied; one day the ration might be all cabbage, next day all radishes. Stewed, they looked and tasted like grass. No good-quality legumes or tubers were issued. Canteens sold eggs, meat, bananas, peanuts, beans, and sugar; unhappily, however, only a few had money to make purchases, mostly officers, who, as a group, acted as useful controls, very few of them developing vitamin deficiency in this period of captivity. For the majority the diet was Japanese rations.

INITIAL SYMPTOMS

Early development of clinical vitamin deficiency was expected, but it took longer than anticipated, four months elapsing before well-defined cases appeared. In June and July lesions of the mouth and scrotum developed. The scrotal lesion consisted of a redness and thickening of the skin on the anterior aspect but sparing the midline; the thickened scrotum was covered with a fine scale. At first there was only irritation; later came excoriation and secondary infection, and a few developed diphtheritic membranes over the scrotal lesions.

Complaints of sore tongue were made about the same time. The tip of the tongue became reddened and depapillated; later the redness and depapillation spread extensively over the dorsum of the tongue. A very characteristic appearance was a reddened margin and tip, with a band of redness passing dorsally in the midline, the rest of the tongue being normal. Angular stomatitis and cheilosis were common. In some severe cases there was a panstomatitis; the tongue, lips, gums, and fauces became reddened and swollen, causing much pain and discomfort.

These scrotal and oral lesions resisted local applications, such as zinc ointment, mouth washes, glycerin, and borax, but responded readily to brewers' yeast, each man receiving a cube 5 g. in weight for 10–14 days. 'Marmite' was even more efficacious. At this stage an odd case of true pellagrous skin rash was seen. The oral and scrotal lesions affected fully half the prisoners and were clearly those of pellagra and ariboflavinosis; but lesions of the nares and vascularisation of the cornea were not seen, though searched for. Lesions of the anus and prepuce described in ariboflavinosis were not observed, but they may have been missed.

ONSET OF "BURNING FEET"

Shortly after the pellagra and ariboflavinosis became manifest on a large scale, a few men began to report sick with "burning feet." This happened about the beginning of July, 1942. The men described the pain as an ache or burning in the feet, usually localised to the metatarsophalangeal region, especially on the volar surface, but in some cases involving the dorsum, and in a smaller group the instep; occasionally the whole foot was affected. All cases were bilateral. This pain was worst at night and caused much insomnia. Through the day the men were comparatively free from pain. Nights, however, were spent massaging the feet or incessantly walking in the compound, both acts giving relief. Other men sat with their feet in a bucket of water; they were a pathetic sight during their long nocturnal vigils. Sooner or later, and in a few cases right from the start, there developed, on top of the continuous burning aching pain, an intermittent stabbing shooting "electric" pain. These pains came on in spasms and radiated up the leg from the foot and in some cases involved the knees. Occasionally the stabbing pains were confined to the feet. They seemed to be much more severe than the continuous aching pain.

The striking feature of this condition was its pronounced daytime remission when the patient was active

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and walking about. In the early stages these men retained their general health, but later they tended to lose weight and look "washed out." Their appetite was poor, but indigestion and bowel upsets were rare. A few complained of pains in their hands, localised to the fingers and usually described as a tingling or numbness, but these were not a usual feature of the syndrome.

FULLY DEVELOPED CLINICAL PICTURE

General Condition.—Usually there was some loss of weight, but in some cases there was no loss, and a few men were emaciated. Scrotal dermatitis, angular stomatitis, cheilosis, and glossitis were common. An odd pellagrous rash was seen. Pulse-rate normal; hearts clinically not enlarged; no cardiac murmurs; blood-pressures low. No respiratory symptoms or signs.

Central Nervous System.—Apart from a few cases showing retrobulbar neuritis, the cranial nerves showed no abnormality.

Legs.—In a few cases the deep reflexes were either normal or diminished, but the characteristic feature was exaggeration, sometimes very gross, the kick being unusually brisk and easily elicited by light percussion. Neither ankle clonus nor extensor plantar responses developed, nor did the limbs become spastic. The legs shared in the general wasting but showed no local muscle wasting or weakness. The skin of the legs showed no trophic or colour changes, the vessels were normally palpable, and there was no obvious change in skin temperature. Coördination and movements normal, tone normal, no loss of power.

Sensation.—There was usually tenderness of the feet at the site of the pain. This was due to superficial hyperæsthesia in some cases, but more commonly a deep muscle tenderness was present. As the cases progressed this hyperæsthesia tended to be replaced by hypoæsthesia, many cases showing a patchy distribution of hypo- and hyper-æsthesia in the feet and lower parts of the leg. A few showed no sensory changes. The main features of these sensory changes were their patchy distribution, their changeability, and their incompleteness. Nothing like a true stocking anæsthesia was observed. Joint sense appeared to be intact; tests for vibration sense could not be undertaken.

Arms.—Deep reflexes were exaggerated, but there was no hyperæsthesia or tenderness as in the legs. The few men complaining of pain or tingling had some blunting of sensation in the finger-tips.

Gait.—Characteristically the men walked slowly and cautiously, holding their legs stiffly, and showed a foot-consciousness reminiscent of a man with bad corns.

COURSE

In the average case the malady dominated the man's whole life. He could usually do light work and take part in the camp life, but the incessant pain and insomnia showed plainly in his strained, worn, and unhappy features.

Though the vast majority of men with burning feet were cured before they became bedridden, a few had reached this stage before the correct method of treatment had been discovered. They were seen as emaciated bedridden men with intercurrent skin sepsis. Some of these died, who to the end showed only exaggerated reflexes, wasting, and skin sepsis, and did not develop Babinski's sign or ankle clonus.

Thus a syndrome beginning early in July, 1942, developed during August and September, and by October had reached a wide incidence, fully 10–12% of the camp strength having been involved. In the average camp of 1500–2000 men up to 200–300 were affected.

OCULAR SYNDROME

Associated with burning feet, but appearing somewhat later during September-October, local eye irritation developed, followed closely by blurring of the vision and loss of visual acuity. Mild conjunctivitis, with lacrimation and photophobia, developed and was followed in two or three days or as many weeks by a rapid loss of vision. After this rapid onset the visual defect tended to remain stationary.

Apart from some conjunctival injection, no external abnormalities were seen. The cornea, pupil, and iris showed no change. Movement and reaction to light and on accommodation were normal. An odd case had global tenderness. Visual acuity was greatly impaired, 6/60 vision being usual. The condition was bilateral, but the eyes were often unequally involved. Rough tests of the visual fields suggested the presence of a central scotoma.

In some cases the fundus appeared normal, but in many others the disk was red and blurred, suggesting a mild papillitis. Many cases showed an excess of black pigment round the disk, and in the retina areas of green pigmentation were seen; these radiated concentrically from the disk and when well marked produced a most striking appearance. These changes were probably due to retinal œdema. No hæmorrhages or exudates were seen. There was no parallelism between the severity of the fundus changes and the functional loss. Control cases without eye symptoms showed no disk changes.

After the rapid onset the visual upset usually remained stationary or tended to improve slowly, but complete recovery was not often seen within the first six months of observation in spite of various therapies.

Some 10% of burning feet cases developed retrobulbar neuritis; cases of neuritis developed without the peripheral pains, but the two conditions were usually associated. This retrobulbar neuritis has been reported extensively in recent publications.

ÆTIOLOGY

The evidence in favour of burning feet being due to a vitamin deficiency is as follows:

(1) The syndrome followed the development of well-recognised signs of vitamin-B_2 deficiency.

(2) Cases were rare among officers, and the few that did occur were mild and developed later. Officers as a group possessed money and could buy eggs, a little meat, soya bean, and kachang hijau bean—i.e., food rich in vitamins and protein. The kachang hijau bean (*Phaseolus radiata*) is a small green legume rich in vitamins B_1 and B_2.

(3) In the geographically separate and socially isolated P.O.W. camps in Java this syndrome developed at about the same period and was clinically identical. This fact discounted a theory that the condition was psychoneurotic.

(4) The syndrome could be cured with substances rich in the B complex of vitamins—e.g., yeast, marmite, and kachang hijau.

These facts did not suggest what particular vitamin or vitamins were deficient, but the antecedent pellagra and ariboflavinosis pointed to vitamin B_2.

TREATMENT

Therapeutic trials with the available pure vitamins were undertaken. Only thiamine and vitamin A were available in large quantities.

(1) Ten cases were given 10 mg. of thiamine by injection daily for 28 days. No improvement was recorded.

(2) Three cases were given 100 mg. of nicotinic acid daily for two weeks. One patient lost the shooting pains but retained the continuous ache; otherwise no changes were recorded.

(3) Huge doses of vitamin A as red-palm oil $^1/_2$ oz. daily for 4–6 weeks produced no improvement.

Thus thiamine and vitamin A in adequate dosage did not cure the syndrome. The short supply of nicotinic acid and the absence of riboflavine and other substances of the vitamin-B_2 complex made adequate trials impossible. Therefore it was decided to administer substances

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rich in vitamins B_1 and B_2. Treatment with kachang hijau beans in a dose of 150 g. daily cured the burning feet syndrome in 4–6 weeks. Subjective symptoms and tenderness disappeared, and exaggerated deep reflexes returned, more slowly, to normal. The effect on the eye symptoms was minimal, and any improvements recorded did not exceed the tendency of untreated cases to recover partially. In other camps the burning feet syndrome was cured with yeast and marmite, but the eye symptoms persisted.

DISCUSSION

This syndrome appears to be due to a vitamin deficiency and can be cured with substances rich in vitamin-B complex but not with thiamine alone. Therefore it is considered that some factors in the vitamin-B_2 complex, contained in yeast and kachang hijau, were responsible for the cure. The possible relationship of burning feet to the nervous lesions caused by deficiency of vitamin B_2—known as pellagra of the nervous system—should be mentioned. Neurologically the syndrome amounted to peripheral pains, with exaggeration of deep reflexes and alteration of cutaneous and deep muscle sensitivity. Neurological manifestations of pellagra are most protean: pains, paræsthesia, burning feelings, and numbness, with varying motor phenomena, from asthenia and hypotonia to stiffness and exaggeration of reflexes. The picture varies from that of peripheral neuritis to an ataxic paraplegia.[1] If burning feet is an early neurological manifestation of pellagra, the unusual features were:

(1) Maintenance of the exaggerated reflexes without development of other signs of upper-neurone lesion—either Babinski response or ankle clonus.
(2) Absence of ataxia, incoördination, or loss of joint sense.
(3) Clinical purity of the condition.

Possible explanations of these unusual features are:

(1) The syndrome developed under almost ideal experimental conditions. A group of men were suddenly exposed to malnutrition and insanitary living conditions. Most were young healthy men. Hypovitaminosis would be expected and would tend to be of similar nature from case to case.
(2) The vast majority of cases were cured within 4–6 months of the onset of symptoms.
(3) The cases were all acute, developing after 6–9 months of malnutrition. Compare endemic pellagra, a chronic disease with a background of irregularly inadequate diet of years' duration.

Retrobulbar neuritis, associated with the skin and mucosal lesions of ariboflavinosis, is a well-recognised condition among native peoples in the tropics living on diets poor in proteins and vitamin-B complex. It is curable in the early stages with yeast or marmite. Service specialists describe retrobulbar neuritis among returned Japanese ex-P.O.W.

Syndromes similar to burning feet have been described among prisoners and internees during the late war. The cases of Spillane and Scott[2] among German P.O.W. in Africa are of special interest. The eye symptoms and hyperæsthesiæ closely resemble the conditions described in this paper, but the subsequent development of ataxia and nerve deafness represents a divergence in the two conditions.

1. Wilson, S. A. K. Neurology, London, 1940.
2. Spillane, J. D., Scott, G. I. *Lancet*, 1945, ii, 261.

A CATALOGUE of the library of the Wellcome Historical Medical Museum is being prepared, but it will be some time before it is published. Meanwhile, Dr. E. Ashworth Underwood, the director, will be pleased to supply on request lists of the works and editions of any writers on medicine or the allied sciences which are in the library. It is hoped to open the library for the use of students at an early date.

NUTRITIONAL DEFICIENCY, PAINFUL FEET, HIGH BLOOD-PRESSURE IN HONG-KONG

G. F. HARRISON
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DURING the occupation of Hong-Kong by the Japanese many patients arrived in hospital suffering from nutritional deficiency. In general their clinical pictures corresponded to those described as beriberi, hyporiboflavinosis, and pellagra (Niles 1923, Low 1936, Heatly-Spencer and Biggam 1938, Stannus 1944, Strong 1945). The published work on vitamin-B deficiency is most confusing, and no useful purpose would be served here by attempting to review it. Where one disease ends and another begins is not always clear.

In the early days of the occupation (Hong-Kong capitulated to the Japanese on Dec. 25, 1941) digestive troubles, diarrhœa, and dysentery developed, and shortly afterwards painful feet, sore mouths, sore tongues, angular stomatitis, cheilosis, and scrotal eczema. Corneal dystrophy, corneal ulcers, and the first cases of retrobulbar neuropathy then began to be observed, a syndrome very similar to that described by Landor and Pallister (1935) in Singapore. The patients remaining in hospital when peace came were those who had had severe affection of the central nervous system leaving them with ataxia, numbness of the limbs, weakness, and in many cases retrobulbar neuropathy.

PAINFUL FEET

The outstanding symptom almost throughout the occupation was painful feet. In the early days the pain was so severe that morphine gr. $^1/_2$ by mouth was the only drug which had the slightest effect on it. Some patients required gr. 1. Aspirin, or tablets containing aspirin, phenacetin, and caffeine or codeine, did not have much effect. Later, the intensity of the pain diminished, and the less potent drugs were used with greater effect. The pains in the feet were accompanied by insensitivity or lessened sensitivity to touch with wool or to pinprick, and loss of hot and cold sensation over areas varying from the whole of both legs in some cases to small areas over the feet and ankle regions in others. Vibration sense was usually diminished or absent over the ankles, often over the knees, and sometimes over the hips. Joint sense and sense of position were commonly absent in the toes. Extreme hyperæsthesia of the soles of the feet was so frequently present that it was difficult to elicit the plantar response; when elicited it was, with very few exceptions, flexor. The external appearance of the feet varied from patient to patient, and in any one patient might vary from day to day. Sometimes the feet were white and cold to the touch, though the patient might say they felt "burning hot," or they might be red, swollen, and hot. Rarely one foot would be white and cold and the other red and swollen.

So far as it is possible to classify them, the pains in the feet could be divided into three types: (1) burning, (2) stabbing, and (3) aching.

(1) The *burning* pain corresponded in many particulars to that described by Lewis and Hess (1933) and Lewis (1933) under the name erythromelalgia or erythralgia. This type of pain was lessened by cooling the feet. Many patients tried to keep their feet for hours in cold water (this practice was discouraged). The pain was increased by warmth, and consequently many of the patients kept their feet out of the bedclothes at night. Counter-pressure by firmly grasping the feet between the hands appeared to give some relief. Lewis and Hess (1933)

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say that those who complain of burning pain are cases of erythrocyanosis of the feet, severe and chronic chilblains, and thrombo-angiitis obliterans. Many patients with painful feet had, for the first time in their lives, severe and chronic chilblains, and one patient had symptoms suggesting the early stages of thrombo-angiitis obliterans.

(2) The *stabbing* pains were the same as those of tabes, except that they were confined to the feet and ankles. They were assumed to be root pains. They were not present in every case, and then only occasionally.

(3) Dull continuous *aching* pains were always present, whether the other two types of pain were there or not.

EFFECTS OF DRUGS ON PAIN

Calcium.—10 c.cm. of 10% calcium gluconate was given intravenously to 11 patients as an experiment. Several such injections were given to each patient. The patient could feel the "flush" spreading down the body. If the "flush" or sense of warmth reached the feet, the pain might or might not be partially or completely relieved for anything from 10 minutes to 5 hours. If the "flush" did not reach the feet, the pains were not relieved. The fact that a previous injection had produced relief of pain did not ensure that there would be a similar relief next time, even though the "flush" did reach the feet. Of the 11 patients, 9 experienced this temporary relief from pain and 2 had no relief. Blood-pressure, chiefly the diastolic pressure, was high in 6 of the 11 patients. Injection of calcium did not lower the blood-pressure even temporarily either in the arm or in the leg, whether the pain was relieved or not.

One patient who had pain equally in both feet was made to lie on his bed. The blood-pressure in the right popliteal space was 150/95 mm. Hg; in the left 155/100. The sphygmomanometer cuff was placed above the left knee and the pressure raised to 200 mm. Hg. An injection of 10 c.cm. of 10% calcium gluconate was made into the right arm intravenously. A few minutes later the pain disappeared completely from the right (unobstructed) foot. The pressure in the cuff on the left leg was then reduced to 0. Pain continued in the left foot. The right foot remained free from pain for 15 min. or more. Blood-pressures in the right and left popliteal spaces a few minutes later were 155/95 and 160/100 mm. Hg.

Simpson (1940), writing on Raynaud's disease, refers to the sedative action of calcium on the neuromuscular junction and says that it may thus diminish vasospasm. The exact cause of these dull aching pains is uncertain, but it appears to have been connected with a diminished blood-supply to the feet, due to vasospasm. Calcium relieved this spasm and more often than not relieved this type of pain.

Nicotinic Acid.—The usual dose given was 20 mg. subcutaneously. When the tablets were available, some patients received 100 mg. daily by mouth. From the point of view of subjective sensations there was little to choose between the effects of either dose. The pain in the feet was either unaltered, temporarily relieved, or made temporarily worse. Among those who said that the nicotinic acid relieved the pain the type of comment was: "It brought the blood to the feet just as the calcium did."

One patient, who used to flush readily with 20 mg. of nicotinic acid subcutaneously, was given an unmeasured but evidently exceedingly large amount of nicotinic acid by mouth—in fact, he was given the deposit from the unshaken bottle of nicotinic-acid solution to see whether the deposit did or did not contain nicotinic acid, there being some doubt about this. He became lobster red from head to toes. The pains disappeared completely from his feet for 24 hours, and a very happy man exclaimed that this was the first real relief from pain he had had in 18 months.

Here again the effect of the drug seems to be vasodilatory or antispasmodic, the subjective sensation after administration varying in no particular from that produced by calcium.

Amyl Nitrite.—This was tried on one patient only, there being only two other ampoules available in the hospital. The patient was a truculent man who, it was thought, would have been glad to announce that the drug had made the pains worse. Asked to report the effect, if any, of inhaling the capsule, he replied that he had almost immediate complete relief of pain for about 5 minutes, and then the pains returned again. The effect was consistent with the well-known brief action of amyl nitrite. The interest lies in the fact that a powerful vasodilator relieved the pain.

EFFECT OF OTHER FACTORS ON SYMPTOMS

Exercise had a beneficial effect on the pain. When the feet were first put to the ground, pins-and-needles were felt; but when the circulation had been restored the pains were distinctly lessened or even abolished for a time. Those who conscientiously walked about each day as much as possible made a speedier recovery than those who could or would not make the effort. The recovery was in either case extremely slow and was measured in years rather than months, even though such patients were on regular daily doses of nicotinic acid (20 mg. subcutaneously) and thiamine chloride (3–5 mg. daily by mouth), besides yeast drinks and other foods containing vitamin-B complex which were obtainable from time to time.

Hot-water Bottle against the Spine.—As an experiment in the treatment of numbness and stiffness, 7 patients were asked to lie each on a soft hot-water bottle placed in the midline under the spine, and to report on the results. One man said it had no effect; 5 that it had a good effect; and one that it had a bad effect.

Smoking.—Three patients said that they had given up smoking, one because it "drew all the muscles up," another because within 10 minutes of his lighting a pipe the muscles of the legs "tightened up," and the third because a cigarette "tightened up the muscles." Many other patients made similar statements.

BLOOD-PRESSURE

Search of the writings on pellagra and beriberi has revealed no mention of high blood-pressure in these conditions. Where blood-pressure has been mentioned it has usually been low. The findings in 76 out of 400 case-records of patients with malnutrition in the

BLOOD-PRESSURE IN 76 CASES OF HYPOVITAMINOSIS

Case no.	Age (yrs.)	B.P. (mm. Hg)		Case no.	Age (yrs.)	B.P. (mm. Hg)		Case no.	Age (yrs.)	B.P. (mm. Hg)	
		Systolic	Diastolic			Systolic	Diastolic			Systolic	Diastolic
1	23	158	124	27	28	120	106	52	23	124	90
2	36	140	100	28	43	152	110	53	21	168	124
3	24	180	110	29	34	125	95	54	22	130	90
4	23	130	105	30	39	112	92	55	29	114	90
5	36	140	108	31	26	135	100	56	24	162	108
6	22	130	96	32	35	150	95	57	42	155	100
7	22	134	102	33	21	135	100	58	28	124	90
8	29	124	104	34	21	140	92	59	39	105	90
9	50	125	100	35	39	180	115	60	28	138	90
10	23	150	115	36	21	130	100	61	27	124	92
11	23	140	100	37	26	160	124	62	29	145	100
12	21	130	100	38	27	135	90	63	31	140	100
13	30	140	105	39	27	140	110	64	37	140	100
14	38	140	98	40	29	170	100	65	30	140	90
15	33	140	110	41	42	124	114	66	30	124	90
16	42	130	110	42	23	128	98	67	23	122	90
17	34	130	95	43	47	174	114	68	26	118	94
18	23	150	95	44	20	120	110	69	24	130	96
19	28	120	95	45	42	164	104	70	49	180	120
20	24	135	95	46	21	140	104	71	21	124	112
21	20	150	100	47	30	150	105	72	22	128	90
22	21	122	96	48	20	124	94	73	25	170	120
23	39	140	100	49	23	120	90	74	21	115	90
24	28	180	120	50	21	124	94	75	22	130	90
25	40	124	94	51	28	125	90	76	35	128	98
26	22	115	95	..	..	..	..	..	..	..	..

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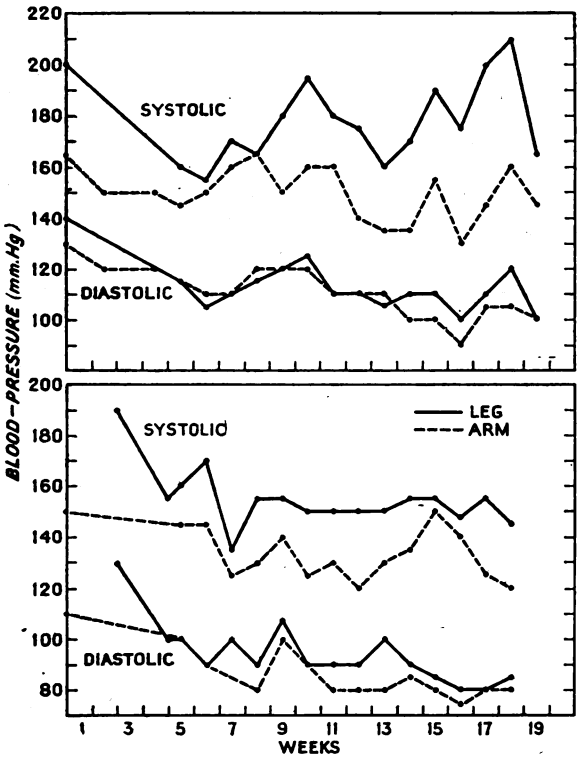

Weekly blood-pressure readings in two patients with malnutrition and painful feet.

Military Hospital, Bowen Road, Hong-Kong, are given in the accompanying table. The actual case-records were burnt by the Japanese, but the proformas used to collect information from these records remain. These do not include any cases of nephritis or infection of the urinary tract. In every case the diastolic pressure is higher than it should be for the age given, and some of the rises of pressure are gross. These 76 patients (19% of the total) represent only those whose blood-pressures were high and were recorded in the case-records. For various reasons not every patient with nutritional deficiency had his blood-pressure measured; so it would be fair to say that *at least* 19% of the 400 patients had at some time—usually at an early stage—a high diastolic pressure.

My own small series contains the weekly blood-pressure readings of 12 patients with malnutrition and painful feet. The records were taken over 7–22 weeks. All readings, except in one case, refer to the arm and leg. Of the 12 cases, 8 are included in the table. Each patient lay on his bed for at least half an hour before his blood-pressure was measured, and in each case the third of three readings was taken. The diastolic pressure was taken to be that point at which the sounds, from being very loud, become muffled. The pressures in the leg were taken in the popliteal space of the right leg, the cuff of the sphygmomanometer being placed just above the right knee. The readings in 2 cases are shown in the figure.

The systolic pressures in the leg are almost always higher than those in the arm; in one patient, on one occasion, the systolic pressure was 50 mm. Hg higher in the leg than in the arm. The differences in the diastolic pressures between arm and leg are much less pronounced. The pressures nearly always gradually returned to normal, although the process was by no means even. The return to normal coincided with a general improvement in the patient's condition and in particular with a lessening of pain.

Some explanation is required for these abnormal pressures. Pain may cause a rise of blood-pressure, but not all of the patients with raised B.P. had pain; some had developed a merciful numbness of the legs. Dally (1936) says that emotions such as excitement, fear, joy, grief, and anger, and mental states such as worry and concentration all raise systolic pressure, the diastolic pressure being far less influenced, and that pain and cold affect both systolic and diastolic pressures. Some of these factors may have helped, but I feel that they were not the main cause. Dally refers to the great significance of the diastolic pressure as a measure of arteriolar resistance and vasomotor nervous tone, and to the part played by the sympathetic nervous system in regulating the calibre of the arterioles and in inducing vasoconstriction over large areas with resulting rise of blood-pressure. "It is clear," he says, "that spastic constriction of the arterioles is the dominant factor in the production not only of high blood-pressure itself but of many of its symptoms and complications." Since pain in the feet was closely connected with a spastic condition of the vessels to the feet, it is not unreasonable to conclude that arteriolar spasm was the cause of the high blood-pressures.

COMMENTS

The impression received from studying these patients with nutritional deficiency was one of *tension*. Most of them were nervous, wrought up, and unable to relax. They would jump at unexpected noises. They were emotional and easily moved to tears. Coarse tremors were common. The patients complained of "stiffness" of muscles, "tightness" across the chest, and sometimes cramps in the calf. The relief of pain by calcium intravenously, nicotinic acid, and amyl nitrite, all vasodilators, suggests that this symptom was due to vasospasm which deprived the feet, and in some cases the hands, of their normal blood-supply. Walking and exercises, such as used to be recommended for Buerger's disease, seemed to relieve some of the pain; any measure which improved the circulation in the extremities appeared to be beneficial. The abnormal rise of blood-pressure in some of the cases can also be attributed to vasospasm. No explanation is offered for the effects obtained by placing a hot-water bottle against the spine, except that moderate heat in any form acts as an antispasmodic.

Spasm of involuntary muscle in any part of the body appears to have been the immediate cause of many of the symptoms and some of the signs noted. Our experience with a massive dose of nicotinic acid in one case suggests that where its vasodilator action is required it should be used in larger doses than those usually recommended, although it must be admitted that Strong (1945) mentions some authorities who have given as much as 1500–2000 mg. a day. If the drug had been obtainable in larger quantities I would have given at least 1400 mg. a day to my patients in hourly or two-hourly doses of 100 or 200 mg. according to each man's reactions—at any rate in the earlier stages when the patient's life was made miserable by incessant pains, stiffness, and other symptoms already described. This opinion has, of course, no bearing on the maintenance dosage necessary to prevent nicotinic-acid deficiency.

SUMMARY

The outstanding symptom of nutritional deficiency in prisoners-of-war in Hong-Kong was painful feet.

At least 19% of the case-records showed a high diastolic blood-pressure at some stage.

It is suggested that the cause of the main type of pain and of the high diastolic pressure was spasm of the blood-vessels.

Spasm of involuntary muscles was present in other parts of the body.

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Nicotinic acid should be used in larger doses than are usually recommended where its vasodilator action is required.

I wish to thank Maj. Gen. A. G. Biggam, C.B., consulting physician to the British Army, for permission to publish this paper.

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Reviews of Books

Dietotherapy

Clinical Application of Modern Nutrition. MICHAEL G. WOHL, M.D., associate professor of medicine, Temple University School of Medicine; chairman, advisory committee on nutrition, Philadelphia Department of Public Health. London: W. B. Saunders. Pp. 1029. 50*s*.

THIS book, by some 60 authors, all recognised investigators in their fields, covers normal nutrition, physiology of the gastro-intestinal tract, water metabolism, trace elements, vitamins, nutrition in periods of physiological stress, including pregnancy, nutrition in the aged and the athlete, and in relation to infection and immunity, nutrition in disease, in dentistry, in obesity and leanness, and in the psychiatric patient. Preoperative and postoperative nutrition and amino-acid feeding are also dealt with.

Throughout the clinical sections there is a pleasing absence of fads and fancies, the approach being scientific and balanced and the nutritional requirements of a particular organ subordinated to the health of the body as a whole. For example, in choosing a diet for a patient with nephritis, the physician is advised to ask: "How must the diet be modified to improve the condition of the patient without exaggerating the nephritis?"—an essentially sound approach.

Instructions are clear, and a wide choice of detailed diet sheets provided which, to readers in this country, may sometimes seem over elaborate, though they make appetising reading. For patients with gall-bladder and liver diseases alone, detailed diets of seven types are given. Many of the diets would need modifying to suit present-day rations in other countries, an aspect which the authors do not seem to have considered. The book covers a wide field with few omissions, but says surprisingly little about the physiology and management of starvation.

Practice of Sex Education

EUSTACE CHESSER, L.R.C.P.E.; ZOË DAWE. London: Medical Publications. Pp. 157. 10*s*. 6*d*.

THIS book calls itself a plain guide for parents and teachers. The subject is introduced by Dr. Chesser, who is evidently an enthusiast for clear statement in sex education. He accepts as inevitable the fact that very few parents will be able or willing to guide their children in the matter of understanding sex and prefers that this should be done in school as part of biology teaching rather than not be done at all. His enthusiasm might lead him to a more constructive attitude towards the problems of the parents; it is something of a social disaster that parents should abrogate their responsibilities to the biology teacher. His introduction is followed by the outline of a scheme of talks covering simple biology and including, without undue emphasis, the part played by human reproduction. The scheme is given in some detail, including even rough sketches suitable for the blackboard, but not everybody could use these notes and make them as interesting as Miss Dawe obviously did.

The Endeavour of Jean Fernel

Sir CHARLES SHERRINGTON, O.M., M.D. Camb., F.R.S. London: Cambridge University Press. Pp. 223. 16*s*.

THOSE who had the good fortune to read Sir Charles Sherrington's *Man on His Nature* hoped that he would develop in greater detail the story of the life and work of the physician and philosopher, Jean Fernel. This volume is written in the same scholarly and arresting manner as the first. With affectionate admiration, Sir Charles shows Fernel to be head and shoulders above most of his contemporaries. He stood on the bridge uniting the old traditions of medicine with our modern outlook, and his face was turned forwards. The Renaissance, which was then sweeping Europe, had but small immediate effect on medicine, but Fernel was close to the Renaissance spirit. His treatises on physiology and pathology are valuable landmarks, and in pathology especially he came near to our modern methods of inquiry. Fernel could not rid himself altogether of the doctrines of "temperament" and its four humoral elements, but he discarded magic and astrology and the other necromancies of the Middle Ages and was a keen observer at the bedside and at necropsy, believing that only thus could the origin and facts of disease be properly elucidated. He stopped short of experiment, however; that was to be the achievement of Harvey. The book is a brilliant study of a great physician and an even greater man.

An Introduction to Essential Hypertension

RICHARD F. HERNDON, M.D., F.A.C.P. London: Baillière. Pp. 88. 14*s*.

WRITTEN in popular style, this booklet is largely a review of American work on hypertension during the past ten years. Despite naïve presentation and a too-conscious straining after "pathological physiology" the author has achieved a balanced survey. He makes it quite clear that the patient is still waiting for the practical benefits which should accrue from the dramatic experimental results of the last few years. It is doubtful whether the grading of essential hypertension according to Wagener and Keith is worth the space devoted to it, and there are conflicting comments on the relation of arterial and arteriolar lesions to hypertension. The cover description of the book as a "humdinger" is perhaps hyperbolic, but the student will certainly get the "low down" on hypertension and a useful introduction to the recent literature.

Disorders of the Blood

(5th ed.) Sir LIONEL WHITBY, C.V.O., M.C., M.D., F.R.C.P., regius professor of physic in the University of Cambridge; C. J. C. BRITTON, M.D., D.P.H., assistant pathologist, the Middlesex Hospital. London: J. & A. Churchill. Pp. 665. 30*s*.

THIS new edition of a standard textbook has been thoroughly revised so as to bring the text and illustrations into line with modern teaching. Some contradictions in the previous edition, in the sections on the development of the red blood-cells and the anæmias, have gone, and the term "megaloblast" is now definitely limited to the primitive embryonic nucleated red cells, or the cells found in pernicious and allied anæmias. In assessing the value of sternal puncture the authors give the common-sense rule that rational diagnosis and treatment can only be based on major changes, which the expert has little difficulty in detecting. New illustrations of marrow pictures in various anæmias have been added from material provided by Dr. J. F. Wilkinson, and a straightforward account of the various "mean cell" measurements should make this subject clear. The hæmolytic anæmias of infancy are properly related to the Rh factors, and it is noted that ABO incompatibility is sometimes responsible as well. A gallant attempt is made to pilot the reader through the maze of Rh terminology, and the authors bring out the fact that the rare types mostly cause difficulty among cases which are Rh-negative to ordinary testing. The blood changes in trichiniasis and histoplasmosis have been added to the infectious diseases section, and the treatment of the tropical diseases mentioned has been brought up to date. This is probably the best British book on blood disorders.

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THE LANCET

LONDON: SATURDAY, JUNE 29, 1946

The Hospital Surveys

IN October, 1941, the Minister of Health announced his intention of initiating a survey of the hospital services of England and Wales. This had three objects: to gather information (never previously collected) about the hospital facilities normally available, to assess the adequacy of those facilities, and to provide a body of expert advice on the best way of coördinating and (if need be) expanding them. England and Wales was divided into 10 areas, in each of which a team of two or three hospital experts conducted the survey. In 3 of the areas—London, north-west England, and south Wales—the surveying officers were appointed by the Minister; in the remaining 7—Berkshire, Buckinghamshire and Oxfordshire, the eastern area, the south-western area, Sheffield and east Midlands area, west Midlands area, Yorkshire area, and the north-eastern area—the surveyors were appointed by the Nuffield Provincial Hospitals Trust. A similar survey of Scottish hospitals, in 5 regions, was initiated by the Secretary of State for Scotland. With the exception of the north-eastern area, the survey reports have now been published by H.M. Stationery Office and have been reviewed in these columns at various times in the last nine months. They reveal a state of things in which the good is mixed with the intolerable, total resources are unequal to total needs, and the coördination on which the surveyors were to advise is mainly notable by its absence. It is not unfair to suggest that the lack of coördination between voluntary and municipal hospitals, and even between voluntary and voluntary and between municipal and municipal, is so striking in most areas as to have been one of the factors which influenced Mr. BEVAN most strongly in his decision to nationalise all hospitals.

The Nuffield Provincial Hospitals Trust has now issued a booklet [1] which summarises the main findings of the surveyors and will be of value to the future members of regional hospital boards and hospital management committees. This reveals that, excluding mental and convalescent hospitals, less than half the hospitals (containing less than a third of the total beds) are under voluntary management. No less remarkable, even allowing for the large number of municipal fever hospitals and maternity homes, is the fact that half the municipal and half the voluntary hospitals of the country are of less than 50 beds, capacity; those with more than 200 beds number less than 100 voluntary but more than 250 municipal hospitals. The parent teaching hospitals, on which the average person tends to base his idea of the standard voluntary hospital, amount to only 30, of which 13 are in London, 7 in the rest of England, 9 in Scotland, and 1 in Wales. Size, per se, is no criterion of excellence, but this large number of small units must encounter difficulties—often insurmountable ones—in providing the consultant, laboratory, and radiological services which are today essential for efficient clinical medicine. Every survey team has suggested closures and amalgamations, not only or even primarily to produce coördination but to form general or special units large enough to ensure the economical use of human and technical resources. Such a policy will have the additional advantage (especially when preliminary training schools become more plentiful) of offering sufficient facilities for comprehensive nursing training. The surveyors also wisely recommend the inclusion of fever hospital blocks in general hospitals. Implementation of the idea of hospital centres, in which wards for medical and surgical, fever, maternity, tuberculous, child, and chronic patients are in close proximity, should counteract the centrifugal tendency of the excessive specialism which has lately characterised medicine in all countries. The hospital provision for the chronic sick, admittedly ignored by the voluntary hospitals and in many districts not well treated by the municipals, has been a cause of serious perturbation to all the surveyors: "the reproach of masses of undiagnosed and untreated cases of chronic type which litter our public-assistance institutions must be removed" (eastern area survey). The provision of better accommodation for these people, with a higher proportion of trained nurses, with arrangements for treatment in those chronic cases which are susceptible of improvement and for periodic medical examination in all, and with proper classification and segregation, are among the more urgent problems facing the regional boards. The duty of the teaching hospitals in this field is clear and generally accepted.

The need for additional hospital beds is serious in many parts of the country and far from negligible elsewhere. Mental hospitals were excluded from the surveys, and if infectious-disease beds (where the problem is one of aggregation and location rather than of existing shortage) are excluded, the remaining 225,000 hospital beds in England and Wales need supplementing by at least 40%. Nor does this figure take account of the "hidden need," on which the north-western area surveyors comment—if a good gynæcological service is provided where previously there was none, in a short time the beds are filled and there is a waiting-list. And so with beds for other conditions. A kindred problem is that of providing enough consultants and in the right places. So far there has been no reasonable living to be made by private consultant and honorary hospital practice in the smaller centres. Despite the ease of modern communications and the consequent widening of the range from which patients can be drawn to the large towns, and despite the importance of maintaining close contact with university medicine, it will be essential to evolve a system under which consultants live in the area where they work. The main method by which this can be secured is through payment for hospital work, and it was perhaps with this in mind that the Minister provided for the employment of consultants through regional boards.

The replacement of the present uncoördinated and competitive series of hospitals by a unified system under regional boards is not without its dangers. The chief of these is an excessive central control which will stifle peripheral initiative, and Mr. BEVAN has not allayed misgivings, and indeed has alienated valuable support, by his insistence that hospital.

1. The Hospital Surveys. Nuffield Provincial Hospitals Trust, 12, Mecklenburgh Square, London, W.C.1.

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management committees shall not have the statutory rights appropriate to the responsibilities he intends them to bear. "Responsibility without rights" does not sound like a hopeful basis for the individual effort which hospitals will still have to make if they are to avoid uniformity and stagnation. In these matters much can be learnt, both by way of example and by way of warning, from the experience of the London County Council, who in 1930, under the distinguished leadership of Sir FREDERICK MENZIES, took over the hospitals of the Metropolitan Asylums Board and 26 boards of guardians and welded them into an integrated service of higher standard. The assimilation of 75 general and special hospitals with 40,000 beds and 26,000 staff was a task of the first magnitude, taking several years to complete, and it is clearly comparable to the job facing regional boards, who may not have to handle larger total resources but will have to deal with those resources scattered over smaller and more numerous units—on the average probably about 200 units each—and over much wider areas. The mental hospitals, moreover, will have to be taken over and made part of the general system immediately, whereas the L.C.C. postponed fusing the administration of the mental-hospital service with that of the other hospitals for several years. Central purchasing and accounting, planned adaptations and extensions, central control of budgets and finance, and central staff-appointment systems are bound to make the individual hospital feel that its individuality is diminished and its initiative fettered. Much conscious effort and ingenuity at the centre will be needed to combine local freedom with the necessary degree of control. Departmental committees on which individual members of hospital staffs are strongly represented at all levels, to make appointments and deal with common problems, frequent visits of central staffs to individual hospitals, sports associations, and above all the constant recognition that each hospital is part of a vital machine serving the sick of the area, will help. Inter-hospital visiting, medical and nursing societies, and staff committees covering all branches of personnel should receive the active support of regional boards and management committees.

The hospital surveys have sadly proved the need for change and integration, but a great opportunity as well as a great responsibility now lies before hospital staffs and hospital administrators. The main defects of the present can be summarised as inadequate accommodation, shortage and maldistribution of consultants, lack of coördination, and the absence of any real system to deal with the chronic sick. In the proper combination of team-work and of individual responsibility and initiative lies the key to future improvement.

Hydraulics of the Peritoneal Cavity

IN 1900 FOWLER [1] recommended the adoption of an "elevated head and trunk posture" in the post-operative treatment of "diffuse septic peritonitis." Since then most abdominal surgeons have adopted the Fowler position (with or without modifications) as a routine, but lately SPALDING [2] has questioned its advisability. Experience will show whether his views are correct, but his arguments in their favour have drawn attention to the complex problem of absorption from the peritoneum.

Two channels of absorption exist—the blood-capillaries and the lymphatics. For water and simple crystalloids the subserous blood-capillaries are more than adequate, and considerable amounts of normal saline can be absorbed from the peritoneal cavity by that route in a few hours. Toxins of low molecular weight may possibly also be absorbed through the blood-vessels. But large protein molecules and particulate matter such as red cells and bacteria are removed through the lymphatics, as in other parts of the body. From the point of view of lymphatic absorption, the subphrenic peritoneum is the most important and the pelvic the least, the omentum and mesenteries occupying an intermediate position. RUBIN [3] believed that the omentum plays a prominent part in peritoneal absorption, and though many workers have disputed the existence of omental lymphatics SIMER [4] seems to have established that they are present in man. Eighty years ago VON RECKLINGHAUSEN [5] thought he had found a structural basis for the absorptive efficiency of the subphrenic peritoneum in the form of "stomata" between the peritoneal cells, and his views gave rise to one of the classical controversies of both normal and pathological histology. MACCALLUM'S [6] conclusion that the stomata do not exist was generally accepted for many years, though ALLEN [7] has more recently reverted to VON RECKLINGHAUSEN'S original view. But the presence or absence of stomata does not make any practical difference, for, as MACCALLUM pointed out, "it seems necessary to suppose that the connexions of the endothelial" (i.e., peritoneal) "cells are so lax that the violent pumping action of the respiratory movement is enough to force material between them when they come to form the only obstruction to its entrance." Later papers by CUNNINGHAM [8] and others, introducing the concept of passage through the cells rather than between them, again make no practical difference to the final result.

If the subphrenic peritoneum is the area of most active absorption for particulate matter, how much can it absorb and at what rate? There is experimental evidence on these points. As to the speed, if a suspension of carbon particles is injected into the peritoneal cavity some of them may be found in lymph-nodes above the diaphragm within a few minutes [9] provided that respiratory movements are taking place, even if they are effected by artificial respiration. Paralysis of one half of the diaphragm results in slower absorption on the paralysed side.[10] There may be species differences in the amount which can be absorbed. The rabbit [11] can absorb from the peritoneal cavity in four hours a quantity of whole blood equal to a fifth of its blood-volume, whereas when blood was injected intraperitoneally into the dog [12] only a sixteenth of

1. Fowler, G. R. *Med. Rec.* 1900, **57**, 617.
2. Spalding, J. E. *Lancet*, May 4, 1946, p. 643.
3. Rubin, I. C. *Surg. Gynec. Obstet.* 1911, **12**, 117.
4. Simer, P. H. *Anat. Rec.* 1935, **63**, 253.
5. von Recklinghausen, F. Die Lymphgefässe und ihre Beziehung zum Bindegewebe, Berlin, 1862.
6. MacCallum, W. G. *Bull. Johns Hopk. Hosp.* 1903, **14**, 105.
7. Allen, L. *Anat. Rec.* 1936, **67**, 87.
8. Cunningham, R. S. *Amer. J. Physiol.* 1922, **62**, 298.
9. Higgins, G. M., Graham, A. S. *Arch. Surg., Chicago*, 1929, **19**, 453.
10. Higgins, G. M., Beaver, M. G., Lemon, W. S. *Amer. J. Anat.* 1930, **45**, 137.
11. Siperstein, D. M., Sansby, J. M. *Amer. J. Dis. Child.* 1923, **25**, 107.
12. Florey, H., Witts, L. J. *Lancet*, 1928, **1**, 1323.

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the corpuscles were absorbed in six hours. Animal experiments by HAHN et al.,[13] using red cells containing radio-active iron, showed that a few hours after their intraperitoneal injection these cells could be detected in the blood-stream, and after twenty-four hours about 40% of the cells had been absorbed. The course taken by the cells was perfectly clear, and their lymphatic pathway in the thorax was marked by red lymph-nodes which do not seem to have offered any serious obstruction to their passage. The process in man may be much the same, and there have been advocates [11] of the intraperitoneal route for blood-transfusion under certain conditions. Apart from their practical application, these experiments on the absorption of blood strikingly emphasise the size of the particles which can pass through the diaphragm, for not only mammalian but also amphibian red cells can pass, and it seems a reasonable inference that smaller particles such as bacteria would traverse the diaphragm at least as rapidly, if not more so.

Another fundamental factor in diaphragmatic absorption is the relation between the pressures above and below the diaphragm. One might suppose that during expiration, when the diaphragm is relaxed, it would offer no resistance to the upward pull of the intrapleural negative pressure and the elastic recoil of the lungs, and that the intraperitoneal pressure immediately below the diaphragm would then also be negative (i.e., less than atmospheric). In inspiration, on the other hand, when the diaphragm is contracting, one would expect an increasingly negative pressure in the pleural cavity above the diaphragm, associated with a positive intraperitoneal pressure below it. There would thus be a pressure gradient between the potential cavities above and below the diaphragm making for the rapid upward passage of particulate matter. But the position is not quite so simple. That there are respiratory variations in subphrenic pressure FLOREY [14] demonstrated in the rabbit by inserting between the liver and the diaphragm a small balloon at the end of a rubber catheter. OVERHOLT [15] found in dogs that "the pressure within the peritoneal cavity decreased simultaneously with the decrease in intrapleural pressure during inspiration." He further found that the intraperitoneal pressure was greater in the lower part of the abdomen than in the upper, the difference being more with the animal in the head-up (8–20 cm. of water) than in the horizontal (0·5–4·4 cm. of water) position. Would such a pressure difference be sufficient to ensure, with a patient in Fowler's position, a steady upward flow of fluid from the pelvis to the subphrenic region? SPALDING maintains that it would, though the conditions in OVERHOLT's experiments, with the animal anæsthetised and the abdominal muscles more or less atonic, are not comparable to those in patients. Such an upward movement of fluid would be against gravity; however, it would not be the movement of a simple fluid column, but of a film between many coils of intestine, obeying the laws of capillary attraction rather than those of gravity, and influenced by movements of the viscera and of the trunk. The air which is always present in the peritoneal cavity after laparotomy will interrupt the continuity of the fluid film, and, in the elevated position of the trunk, will reduce the effect of suction from above. In the recumbent position, on the other hand, fluid will pass freely into the subphrenic area, whether or not a pneumoperitoneum is present; whether this is a good thing or a bad thing will depend on whether the normal channels of lymphatic absorption can deal with this large amount of infected fluid, or whether they are overcome, leading to subphrenic abscess.

The teachings of experimental inquiry can then be used to support as well as to attack Fowler's position, and the final answer will come only from clinical research and observation at the bedside. Surgeons, among the most conservative of mankind, will no doubt closely follow the results obtained by those who propose to defy one of their most cherished traditions.

13. Hahn, P. F., Miller, L. L., Robscheit-Robbins, F. S., Bale, W. F., Whipple, G. H. *J. exp. Med.* 1944, **80**, 77.
14. Florey, H. *Brit. J. exp. Path.* 1927, **8**, 497.
15. Overholt, R. H. *Arch. Surg., Chicago*, 1931, **22**, 691.

Filariasis in the Pacific

THE prospect of service on those islands in the Pacific where bancroftian filariasis is common among the native populations caused some apprehension among the American armed forces and their friends at home when it was found that Europeans were just as susceptible to infection as their coloured brethren. Study of the standard medical textbooks, with their illustrations of cases of gross elephantiasis, did nothing to allay this anxiety. Indeed one American writer records that "the end results on morale are terrific." [1] The U.S. Army Medical Corps took steps to investigate the matter, and the most important and unanimous conclusion drawn from their extensive inquiries is that the gross disfiguring deformities commonly encountered in natives in some of the filarial endemic areas of the world are a sequel to often-repeated heavy infections with *Wuchereria bancrofti* over many years, and that brief exposure to infection does not produce them. Prompt removal from the endemic area of men suspected to be infected leads to regression of the early manifestations of the disease, and forestalls the development of the grosser changes classically associated with it. Fears of impotence and of sterility as a sequel to the infection under such circumstances have proved groundless.

The diagnosis of early bancroftian filariasis in the field is difficult, and is largely made on a history of exposure to the risk of infestation and on symptoms and signs. Search of the blood for microfilariæ or a diagnostic eosinophilia is of little help, and the skin reaction to a filarial antigen is not much more valuable.[2] Of the clinical manifestations, attacks of lymphangitis and lymphadenitis, often remote from the areas usually associated with these in the late condition, and tending to progress in the direction opposite to the normal lymph flow, are highly suggestive of filariasis. These episodes are ephemeral and commonly recur in association with slight fever. One or more such attacks of "mumu," with swelling lasting at least one day, in a filarial endemic area are regarded as evidence of infection and an indication for the speedy removal of the Service patient to a temperate climate. Where removal is prompt the symptoms and signs diminish with the passage of time, and in most cases have vanished completely

1. Buchans, R. A. *J. Urol.* 1945, **54**, 59.
2. Behm, A. W., Hayman, J. M. jun. *Amer. J. med. Sci.* 1946, **211**, 385.

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within two years. Very few, if any, such cases have progressed to the late chronic stages of filariasis. Owing to the unfamiliarity of most physicians with early filariasis many cases of adenopathy, commonplace where traumatic and parasitic skin lesions abound, have been tentatively diagnosed as filarial infestation and the patients unnecessarily invalided. Bearing in mind the psychological implications of this infection, every endeavour should be made to limit the numbers of misdiagnosed cases. The usually ill-founded fears associated with the disease and the lack of any specific treatment combine to produce a mental state difficult to combat; so the longer an erroneous diagnosis of filariasis is allowed to persist the greater the difficulty in restoring a man to a normal outlook and active life.

The causation of the symptoms and signs of the early disease, due to involvement of lymphatic tissue, has been much discussed. The intensity of parasitic infestation with adult worms, which are the only form of *Wuchereria bancrofti* known to be capable of causing gross changes in the tissues, is presumably slight; the microfilariæ or larvæ in the circulation in these early cases are so few that they can rarely be found, even with a concentration technique. It is therefore difficult to explain the early symptoms and signs on the grounds of mechanical obstruction of the lymphatics resulting from a reaction to the adult parasite, though such obstruction is doubtless the cause of the irreversible changes seen in the late chronic disease with heavy infestations. A more probable explanation is an allergic reaction of the lymphatic tissues, and the temporary eosinophilia found at the same stage of the disease supports this view.[3] Biopsy of affected lymph-glands, lymphatic vessels, and portions of the pampiniform plexus when funiculitis is evident rarely reveals the presence of parasites, either adult or larval, but does show some characteristic changes—chiefly hyperplasia with eosinophil infiltration and general œdema, and thrombus formation in the lymph channels.[4] Later in the disease, in cases with heavy infestations, dead or degenerating worms are commonly found, with granuloma formation and ultimately fibrotic changes in the lymphatics; and it is these latter fibrotic changes which herald the chronic elephantoid state hitherto regarded as characteristic of filariasis.

In the early, lightly infected, cases there is good reason to believe that the adult worms soon perish, and are dealt with by the body without gross disorganisation of the lymphatic vessels in their vicinity. So far no drugs have convincingly been proved to influence an infection; the organic antimonial, 'Neostibosan,' has been tried as a chemotherapeutic remedy,[5] but its action on the worms has not been entirely effective. A generous diet, rest during recrudescences, reablement by gradually increasing physical activity, and the allaying of fear of the possible complications of the disease, have proved sufficient to deal with the early lightly infected case, if the patient can be removed from the possibility of further infection.[6] Among 10,431 U.S. Navy personnel who acquired filariasis in the South Pacific in 1942, only an occasional man now manifests any signs or symptoms of the infection.[7]

3. Leeds, W. E., Josey, A. I. *Ann. intern. Med.* 1945, **23**, 816.
4. Thompson, K. J., Rifkin, H., Zarrow, M. *J. Amer. med. Ass.* 1945, **129**, 1074.
5. Culbertson, J. T., Rose, H. M., Oliver-Gonzalez, J. *Amer. J. trop. Med.* 1945, **25**, 403; *Amer. J. Hyg.* 1946, **43**, 145.
6. Goodman, A. A., Weinberger, E. M., Lippincott, S. W., Marble, A., Wright, W. H. *Ann. intern. med.* 1945, **23**, 823.
7. Brown, T. McP., Stifler, W. C. jun., Bethea, W. R. jun. *Bull. Johns Hopk. Hosp.* 1946, **78**, 126.

Annotations

SUPPLY AND DEMAND

THE Minister of Health last week expressed the hope that the new National Health Service will come into operation on April 1, 1948.[8] This will enable many demobilised doctors who are still unsettled to fix, at least tentatively, a term to their present insecurity. The extent of their hardship is perhaps still imperfectly understood by the rest of the profession.

The introduction of the Health Bill at any time might have caused some inconvenience, especially to younger men not already holding a permanent appointment; and under ordinary conditions the mass demobilisation of doctors might have been associated with some little disturbance before each man found his niche in civilian life. Together, these circumstances have produced much greater difficulties. The experience of a leading medical agency is that, until the Bill was introduced, there was a steady demand for demobilised doctors alike as successors, partners, and assistants; there was no difficulty in finding employment for demobilised men; and the number of unemployed doctors seemed not to be substantially greater than at other times, allowing for the interval between demobilisation and establishment in a suitable post. The agency is satisfied, too, that, but for the Bill, the number of vacancies would have sufficed to supply nearly all demobilised doctors with the work they wanted. But with the introduction of the Bill the situation changed abruptly. With few exceptions, those principals who would otherwise have retired decided to remain in practice for the time being; those who would have sought new partners decided to hold their hand; and those who might have taken assistants concluded that this was no time for an expansion that might yield no good return before the régime changed in two years' time. Now, with the supply of unemployed doctors greater perhaps than ever before, the demand is said to be less than at any time since this agency was established nearly a century ago.

Demobilised practitioners may be divided into two groups: those in the first have decided against the investment of capital at this juncture and therefore apply for assistantships; while the other, and larger, group are willing to invest capital in a practice, either to provide a permanent home for their families or to obtain some security of tenure against the feared risk of "direction." The demand among this second group is particularly for practices in the South of England. With this one agency alone, the waiting-list in each group amounts to some hundreds.

This state of unemployment is artificial, determined not by a superfluity of doctors in civilian practice—there are indeed too few—but by uncertainty and by economic considerations. The balance of supply against demand for doctors remained more or less even so long as private sale and purchase were acknowledged as the means of regulating distribution. But this system is to be discarded, and the one which replaces it is still two years distant. In face of the proposed change the system of private contract has partially broken down. As suggested in our leading article of June 8, the Minister of Health will have to consider what he can do, before 1948, to bring together the doctor who seeks work and the patient who would benefit from it.

8. See *Lancet*, June 22, p. 944.

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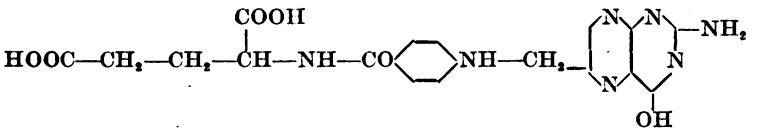
SYNTHETIC FOLIC ACID

THE need for further information about the nature of synthetic folic acid has now been satisfied by Angier and the other 14 members of the team working on the problem[1]; they have announced the structure and described two methods of preparing the liver *L. casei* factor known as folic acid. It is a compound of *p*-aminobenzoyl-*l*(+)-glutamic acid and a pteridine, 2-amino-4-hydroxy-6-methyl pteridine. The linkage is through the 6-methyl group, and the formula proposed is shown here.

The more interesting of the two methods of preparation utilises glutamic acid, *p*-aminobenzoyl chloride, and

FOLIC ACID



N—[4-(2-amino-4-hydroxy-6-pteridyl) methyl amino benzoyl] glutamic acid

propionic aldehyde—all of which are normal laboratory reagents—and 2.4.5-triamino-6-hydroxy-pyrimidine, which should not present any special difficulty in preparation; the yield is 15%. The physical properties of the material obtained have already been described in a previous paper,[2] and this is presumably the material that is now being distributed as folic acid.

This information is of great interest and will clearly lead to much development. Folic acid is not claimed to be the liver principle; it is a bright yellow crystalline substance, whereas the most active liver preparations effective in pernicious anæmia are now colourless. The results with thymine[3] suggest that folic acid acts as an enzyme or co-enzyme which sets in motion the system for the production of the liver principle; all these points will certainly be worked out in time. Meanwhile, here is a single substance of known composition which is therapeutically effective in many macrocytic anæmias. The methods of preparation are not difficult and may be improved. When large-scale production is possible it is likely to supersede liver extracts for all anæmias in which it is found to be useful, since liver extracts have to be biologically tested on pernicious-anæmia patients, and the raw material, like many others, is neither plentiful nor of good quality.

Folic acid is now only available in small quantities for clinical trial under proper conditions; this is as it should be, for the therapeutic trial of new remedies has often been obscured by administration to unsuitable cases, without control, or even by employment as one member of a "blunderbuss" treatment. It should not be long before the field of usefulness of folic acid has been explored.

IODINATED PROTEIN AND LACTATION

IN 1934 Graham[4] increased the milk-production of cows by feeding them with dried thyroid; but the cost of this treatment was too great for commercial application until Ludwig and von Mutzenbecher[5] obtained thyroxine by incubating casein solutions with iodine. Graham's observations were not the first in this field, though they were made independently, for Dr. Robertson points out in a letter this week that Hertoghe[6] obtained almost the same result in 1896, though his work was apparently not followed up and was therefore forgotten. Ludwig's success, which was the culmination of 50 years' attempts by chemists to iodinate serum and other protein solutions, was confirmed by Reineke and Turner[7] in the United States. Their thyroxine-containing product, called thyrolactin, could raise the oxygen consumption of guineapigs, accelerate the metamorphosis of tadpoles, restore the body-growth of thyroidectomised kids, and increase the milk-yield of lactating goats and cows.

In England the subject was investigated under the ægis of the Agricultural Research Council, and the results were published last year. Active fractions of iodinated ox-plasma and ground-nut protein were prepared in the laboratory, but repetition on a large scale proved difficult; when casein was used, Ludwig and von Mutzenbecher's success was repeated.[8] One of the main difficulties lay in the testing of the different fractions; this had to be biological, since it could not be assumed that the acid-insoluble iodine was only present as thyroxine or was proportional to thyroid activity. The usual methods for assaying thyroid products are laborious and unreliable, and an attempt to use the restoration of growth in thyroidectomised rats as a test was unsuccessful.[9] Deanesly, Emmet, and Parkes[10] found that the rana metamorphosis test could be used, but it was not very accurate and had the great disadvantage that the tadpoles are available for only three or four months in the year. The A.R.C. workers therefore resorted to xenopus tadpoles, which have for several years been reared in laboratories in this country because the adult toads are used in pregnancy diagnosis. Deanesly and Parkes[11] worked out the best conditions for rearing the young tadpoles after mating and oviposition have been induced by chorionic gonadotropin and found that they thrive in London tap-water on a diet of liver powder, and favour tall cylindrical vessels. The test consists of putting groups of five tadpoles, 18–25 mm. long, into 250 ml. beakers, adding the dose to be tested as a fine suspension, and recording the proportion whose front legs have erupted within three days. Log dose/response curves are steep.

Preparations of iodinated casein that were active in the tadpole test were given by Blaxter[12] to cows in declining lactation; 30 g. daily for three weeks produced an increase in milk-yield of about 30%; this dose can be satisfactorily incorporated in ordinary cattle cake. Increased yields of 15–33% can be obtained, and are related to dosage, but at the upper limit signs of toxic hypermetabolism appear. Blaxter suggests that an increase of 20% should be aimed at; but even when the dose is adjusted to obtain this response the cows lose weight unless they receive extra food. The milk produced during treatment is normal or richer than normal, and Robertson[13] could detect no rise in basal metabolic rate or pulse-rate in 27 nurses who drank a quart daily for a month. He concludes that if any thyroxine is present in the milk it is insufficient to affect adults.

Blaxter reported that the capacity to increase milk-yield was unrelated to the acid-insoluble iodine content of the samples; and Deanesly and Parkes[14] found that

1. Angier, R. B., et al. *Science*, May 31, 1946, p. 667.
2. *Ibid*, 1945, **102**, 227.
3. Spies, T. D., et al. *Lancet*, June 15, 1946, p. 883.
4. Graham, W. R. jun. *J. Nutrit.* 1934, **7**, 407; *Biochem. J.* 1934, **28**, 1368.
5. Ludwig, V., von Mutzenbecher, P. *Hoppe-Seyl. Z.* 1939, **258**, 195.
6. Hertoghe, E. *Bull. Acad. Méd. belge*, 1896, **10**, 382.
7. Reineke, E. P., Turner, C. W. *Res. Bull. Mo. agric. Exp. Sta.* 1942, no. 355.
8. Pitt Rivers, R., Randall, S. S. *J. Endocrinol.* 1945, **4**, 221.
9. Rowlands, I. W. *Ibid*, p. 305.
10. Deanesly, R., Emmet, J., Parkes, A. S. *Ibid*, p. 312.
11. *Ibid*, p. 324.
12. Blaxter, K. L. *Ibid*, p. 266.
13. Robertson, J. D. *Ibid*, p. 300.
14. *Ibid*, p. 356.

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such iodine content had no fixed relation to the results of the tadpole tests. Apparently the relation varied with different conditions of iodination, and even when these were constant the relation was certainly not linear. The acid-insoluble iodine content of the best artificial samples was still ten times that of samples of dried thyroid of equivalent activity. This suggests that the greater part of the acid-insoluble iodine is not present as thyroxine, and it emphasises the need for biological testing of all preparations intended for cattle. There was fairly close agreement between the results of the tadpole tests and the milk-yield tests among the samples tested by both methods.

The difficulty of establishing the correct dose in the field, particularly as overdosage seems to be dangerous, must be overcome before farmers can derive practical benefit from this research. The laboratory worker has already received his reward in an elegant method of assaying thyroid activity.

THE WORLD HEALTH CONFERENCE

THE conference which is to set up a new World Health Organisation met in New York on June 19, according to schedule. Delegates from all but 11 of the 67 nations invited were present to hear a speech of welcome from President Truman read by Mr. Winant, now the U.S. representative with the United Nations, and also to be greeted by Sir Ramaswami Mudaliar, chairman of the Economic and Social Council, by Mr. Trygve Lie, and by Prof. Henri Langier, the assistant secretary-general for the department of social affairs.

This is the first international conference to be called by the Social and Economic Council, and the first international conference since the war to which non-members of the United Nations—with the single exception of Spain—had been invited. Of the countries participating 15 are non-members, and their representatives, together with representatives of the control commissions of Germany, Japan, and Korea, and of the international organisations interested in health, attend as observers, without vote. Sir Wilson Jameson leads the British delegation, and Surgeon-General Parran, who is heading an impressive U.S. delegation of 25, was unanimously elected chairman of the conference. In spite of its size, however, the American Federation of Labour has protested that the American delegation is composed of persons "opposed to progressive programs in the field of medical economics."

The report of the preparatory committee of experts, which met in Paris,[1] has been accepted by the Economic and Social Council and was transmitted for the consideration of the conference without alteration though with certain observations. The first two days were occupied in general statements by delegates and by discussion in committee of the scope and functions of the new organisation as drafted. With the coincident meetings of the Security Council and the Economic and Social Council, there have inevitably been some difficulties in the arrangements, but our correspondent in Washington hopes that these have been overcome and that this week the conference will be getting down to business, strengthened by a large Russian delegation reported to be on the way.

WELFARE WORK BY THE RED CROSS

THE "welfare" services undertaken during the war by the joint organisation of the British Red Cross Society and the Order of St. John are continuing for the benefit of pensioners and others who have suffered because of the war. Under its supplementary charter, however, the British Red Cross Society is also empowered to assist the civilian population, in any way calculated to promote health, prevent disease, or mitigate suffering, and it has now established a special department of welfare services whose main object will be to supplement the work already being done by voluntary organisations and statutory bodies. This department will operate in three sections concerned with (1) welfare work and aftercare for the civilian disabled, (2) the aftercare of invalid and crippled children, and (3) the care of the aged infirm. The director of welfare services will be Dr. Harold Balme, who will also continue, part-time, his work for the Ministry of Health as medical officer in charge of rehabilitation. His chief task will be to encourage these various forms of welfare activity and coördinate the welfare services already undertaken by members of the Red Cross Society in England and Wales. Many of these are keenly interested in such work, and it is hoped that the establishment of this new department will result in a large accession to their ranks.

1. *Lancet*, April 20, p. 577.

SCIENCE IN THE EMPIRE

WHEN the King opened the Royal Society Empire Scientific Conference at the senate house of London University on June 17 he expressed the hope that this would be the beginning of an era of closer contact in scientific affairs within the Empire. Nearly 500 eminent scientists and others, headed by Sir Robert Robinson, president of the Royal Society, are attending the conference to discuss a wide variety of subjects including agriculture, geology, geography, standards of measurement, ornithology, meteorology, anthropology, physics, chemistry, nutrition, hæmatology, chemotherapy, epidemiology, pharmacology, and tropical medicine. The first sessions of the conference proper were held in London, on June 20–22, and it will end there on July 6–8. In between it was at Cambridge from June 24 to 28, and will be at Oxford from July 1 to 4. Of the many medical discussions the most notable are those on blood-groups (June 24), the physical properties of viruses (June 25), the ætiology and control of infectious and transmissible diseases (June 28), problems of medical science, including factors affecting human life under tropical and industrial conditions, recent advances in chemotherapy (July 1), recent advances in pharmacology (July 2), nutrition, hormones (July 3), and penicillin (July 4).

The conference is to be followed by one of the scientific representatives of the Commonwealth governments and India, and it is hoped that they will hand on recommendations to a further conference of officials for implementation. The aim, as Sir Robert Robinson put it, is "to make the Empire an example to the world of what might be achieved by friendly intellectual intercourse."

Dr. F. Peyton Rous, of the Rockefeller Institute for Medical Research, New York, will deliver a lecture at the Royal College of Surgeons of England, on Wednesday, July 10, at 5 P.M. He will speak on the Antecedents of Cancer. Dr. Rous, who is a foreign member of the Royal Society, was awarded the Walker prize of the college in 1941 for his work on filtrable tumours.

Mr. H. S. Souttar has intimated to the council of the British Medical Association that he is unable to accept nomination to the office of president, and the council has recommended that Sir Hugh Lett be elected president of the association for 1946–47.

THE Nutrition Society, with the help of the British Council, has organised an informal conference of European nutritionists, to be held in Great Britain between July 4 and 20. The object is to enable research-workers in ex-occupied countries to re-establish contacts with their colleagues in this country, and workers here will have an opportunity of learning about conditions and investigations on the Continent. Open meetings will be held at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1, on Friday, July 5, at 2.30 P.M.; on Saturday, July 6, at 10.30 A.M. and 2.30 P.M.; and on Monday, July 8, at 10.30 A.M. and 2.30 P.M.

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Special Articles

THE WORLD'S FOOD

SUBSISTENCE AND MAINTENANCE LEVELS

FROM OUR SPECIAL CORRESPONDENT

A PREPARATORY committee of the Food and Agriculture Organisation of the United Nations reported to the director-general (Sir John Orr, F.R.S.) on the nutritional aspect of the problems which came before the special meetings of the F.A.O. from May 20 to 27. The chairman was Dr. A. Hughes Bryan (UNRRA, Washington), and the members were Dr. John M. Cassels (U.S. Department of Commerce), Dr. L. A. Maynard (combined working party on European food-supplies 1944–45), Dr. A. P. Meiklejohn (UNRRA, London), Dr. E. P. Phipard (U.S. Department of Agriculture), Dr. W. H. Sebrell (National Institute of Health, Bethesda, Maryland), Dr. J. B. Youmans (consultant on Nutrition to Surgeon-General, U.S. Army), Dr. W. R. Aykroyd (F.A.O.), and Mr. D. Lubbock (F.A.O.).

The committee's report recognises:

1. An *emergency subsistence food-consumption level*, needed to prevent the most serious undernutrition leading to disease and the danger of civil unrest. For European countries this level is defined as an average daily intake per head of 1900 calories, requiring a national average supply of not less than 2200 calories at the retail level.

2. A *temporary maintenance level* sufficiently high to maintain populations in fairly good health, but not for rapid and complete recovery. For European countries this level is defined as an average daily intake per head of 2200 calories requiring a national average supply of not less than 2500 calories at the retail level.

The committee regretted the need for considering these levels of consumption but felt that recommendations regarding them would be of practical value in the emergency.

EMERGENCY SUBSISTENCE

Table I gives the individual calorie intake in the different age- and sex-groups and various categories of workers at this level of consumption. It refers to European workers and indicates the point below which the consumption of no section of the population should fall if serious consequences are to be avoided. The figures are approximately 75% of those given in the "recommended allowances" of the National Research Council, U.S.A., and the table is supported by actual experience of the point at which severe undernutrition becomes apparent among European populations.

TABLE I—EMERGENCY SUBSISTENCE CALORIE INTAKE

Category	Calories per day
0– 2 years	1000
3– 5 ,,	1250
6– 9 ,,	1500
10–17 ,,	2000
Pregnant and nursing women	2000
Normal consumers (sedentary) Male	1900
Normal consumers (sedentary) Female	1600
Moderate workers	2000
Heavy workers	2500
Very heavy workers	3000

These figures refer to the actual intake of calories, and assuming a population which as regards age, sex, and activities is approximately the same as that of the United States the average intake is about 1900. It is important that the relation of a per-caput calorie intake figure of this nature to the actual food position in any given country should be clearly understood. Estimates of the total food-supplies available in a country are normally made at the retail level; that is to say, an allowance is made for the loss of food between source and the retail or market level. Allowances for loss up to this stage should equally be made in the case of food *allocations* to deficit countries.

A number of other factors must also be taken into consideration to ensure that no section of a population has a calorie intake below the emergency subsistence level. These are household waste (where food is short about 3% is wasted), and the extent to which distribution is equitable—which covers the proportion of farm to non-farm population, the access of urban populations to food-producing areas, the extent of black markets, the relation of the economic position of the poorer section of the population to food prices, and the age-distribution of the population and the categories of workers included in urban groups. Allowing for all these factors it is necessary, in order to ensure that all sections of a given population obtain the emergency subsistence minimum of 1900, that the per-caput calorie figure obtained by dividing the total food-supplies by the number of the population should be at least 300 calories in excess of the minimum. The committee point out that if the calorie intake of any section of the population falls below the emergency subsistence level for any length of time, then preparations must be made, in advance, for famine relief measures, such as the provision of soup-kitchens, medical supplies, and hospital accommodation to deal with the disease which follows semistarvation. It is too late to organise effective relief once famine has made its appearance.

TEMPORARY MAINTENANCE

The minimum calorie intake per head per day is 2200, and the amount supplied should therefore be 2500 calories at the retail level. Table II shows how the figure of 2200 calories is arrived at.

At this level of diet special attention is given to the protein intake. The per-caput figure amounts to 60 grammes of protein daily, of which 10% should be in the form of animal protein. The committee state that an increase of protein intake will hasten the speed of recovery and that a "reasonably adequate" consumption of animal protein is of value for psychological reasons.

TABLE II—TEMPORARY MAINTENANCE CALORIE INTAKE

Category	Calories per day	Protein per day (g.)
0– 2 years	1000	30
3– 5 ,,	1550	45
6– 9 ,,	1750	55
10–17 ,,	2500	65
Pregnant and nursing women	2500	90
Normal consumers (sedentary) Male	2200	65
Normal consumers (sedentary) Female	1800	65
Moderately heavy workers	2500	65
Heavy workers	3000	65
Very heavy workers	3500	65

NON-EUROPEAN COUNTRIES

The committee point out that in general non-European populations are of smaller average size than European populations, and that in warm climates their basal metabolism and energy output may be lower. Their habitual calorie intake is smaller than that of Europeans, and the emergency subsistence and temporary maintenance figures may generally be 15–20% below those in tables I and II. Protein, in the committee's view, should be reduced by 10% only, but the recommendation about animal protein would "be unrealistic," as such populations normally consume little or none. Considerations regarding the relation between actual intake of food and the amount supplied at the retail level will in general apply equally.

OTHER QUESTIONS

Distribution.—The committee draw special attention to the need for better distribution of food within countries, and point out that this involves effective and equitable crop collection, price control, the discouragement of black markets, and the application of ration scales based on the physiological needs of the different age, sex, and occupation categories within the population.

Governments responsible for seeing that food reaches those most in need of it must give an accurate picture of their food situation, and their method and efficiency of distribution are important.

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Milk.—The committee emphasise the value of processed milk in improving the nutrition of severely malnourished people. The following minimum quantities of milk are recommended for two priority classes :

Category	Milk allowances proposed Litres
0– 2 years	0·75 (whole milk)
3– 5 ,, ...	0·50 (whole milk)
6– 9 ,, ...	0·25 (whole or skimmed)
10–17 ,, ...	0·50 (whole or skimmed)
Pregnant and nursing mothers ..	0·50 (whole milk)

The milk used may be either liquid milk or (if this is not to be had) evaporated or dried milk. And the committee specially recommend that in countries with a well-developed dairy industry an intensive effort should be made to produce dried skimmed milk in maximum quantities for distribution to countries in need. They believe that food imports into any country may be restricted in 1946 and 1947 and recommend that non-farm populations should be encouraged to cultivate vegetables for their own use and that plots of land and seed should be provided. They add that the consumption of vitamins A and C has been meagre in many urban areas of Europe during the winter and spring of 1946.

Vitamins.—Special categories of the population—pregnant and nursing mothers, infants and young children—may benefit by receiving vitamins on medical direction. But the committee disapprove of indiscriminate distribution of vitamins as being likely to produce a false sense of security when the real need is for calories provided by food.

POLIOMYELITIS IN BOARDING-SCHOOLS

RECOMMENDATIONS ON PROCEDURE

IN 1933 the Medical Officers of Schools Association produced a memorandum on the action appropriate when acute anterior poliomyelitis appears in a residential school. Recently the Headmasters' Conference asked the association for a further statement on the subject, and to ensure that this embodied representative opinion the council invited a number of medical bodies and Government departments to participate in preparing it.

At its three meetings unanimous decisions were reached by a committee consisting of Dr. F. M. R. Walshe, F.R.S. (Royal College of Physicians), Prof. H. J. Seddon (Royal College of Surgeons), Dr. A. M. McFarlane (Pathological Society of Great Britain), Dr. J. St. C. Elkington (Association of British Neurologists), Dr. Cyril Banks (Society of Medical Officers of Health), Dr. E. T. Conybeare (Ministry of Health), Dr. A. H. Gale (Ministry of Education), and four representatives of the Medical Officers of Schools Association—namely, the president, Dr. W. H. Bradley (medical officer of the Ministry of Health and sometime medical officer to Downside School), the hon. secretary, Dr. R. E. Smith (medical officer to Rugby School), Dr. G. O. Barber (medical officer to Felsted School), and Dr. M. Mitman, medical superintendent of Joyce Green Hospital, L.C.C.

This committee has (1) prepared a note to headmasters, (2) drafted a letter which headmasters may find valuable if they are called upon to communicate with parents in an emergency, and (3) revised the section on poliomyelitis for the new edition of the association's *Code of Rules for the Prevention of Communicable Diseases in Schools*, which it is hoped to publish in 1947.

NOTE TO HEADMASTERS

Poliomyelitis is known to be an infectious illness. It is infrequently fatal but may lead to paralysis with a permanent disability of movement though not of any other bodily function. In dealing with it the welfare of both the patient and the community has to be considered.

Experience shows that in residential schools only an extremely small percentage of the boys is attacked and that case-to-case infection is not common. In a carefully supervised school the risk of spread after the recognition of the initial case or cases is not large but cannot be wholly excluded. This being so, some parents may wish to remove their child. No objection should be raised to this, but parents who remove their boys should be advised that in doing so they assume a responsibility for isolating them, both in transit to their homes and while at home, from all young children and adolescents for a period of at least three weeks. A boy who has been exposed to the disease may, although himself well, harbour the infection. There are no readily available means of detecting such a " carrier " who may possibly spread the infection by sneezing or coughing or via the bowels. Simple hygienic precautions based on this knowledge will do much to prevent spread.

The known epidemiological facts do not allow of a dogmatic ruling about school dispersal when a single case is recognised. The disease is notifiable to the medical officer of health for the district in which it occurs. The school doctor will communicate with the public health officers who may have information concerning the occurrence of other cases in the locality and who should be consulted before any decision is taken by the headmaster. The occurrence of subsequent cases will undoubtedly increase parental anxiety and on this account alone the wisest course may then be to disperse the school for at least three weeks. In any event the school should be quarantined, all school meetings and outside fixtures being cancelled for the time being.

SUGGESTED BASIS OF LETTER FROM HEADMASTER TO PARENTS

A case of poliomyelitis, commonly known as infantile paralysis, has occurred at the school. The nature and possible results of this illness make it desirable that parents should consider the following points which are put before them as part of the advice on this subject recently given by a representative body of doctors to the Headmasters' Conference of which I am a member.

Although poliomyelitis is rarely fatal it may lead to paralysis and varying degrees of permanent disability of movement but not of any other bodily function. It is an infectious disease and in dealing with it the welfare of the community has to be considered as well as that of the patient. Experience shows that in residential schools relatively few boys are attacked and that extensive outbreaks are not common. In a carefully supervised school the risk of spread after recognition of the initial case is small though it cannot be completely excluded.

It is appreciated that in these circumstances some parents may wish to remove their boys. No objection is raised to this but parents who do so should realise that they must assume responsibility for isolating their boys both on the journey home and afterwards from all young children and adolescents for a period of at least three weeks. A boy who has been exposed to the disease may, although himself well, harbour the infection. There is no means of detecting such carriers, who may spread the infection by sneezing and coughing or from the bowels, and simple hygienic precautions against these possibilities should be taken.

If after arrival home a boy develops a temperature or complains of headache or stiffness or pains in the neck and back he should at once be put to bed and a doctor consulted. If you decide to remove your son the medical officer of health in your district will be informed.

If, as may well be, you decide to leave your son at school, his education will continue. The school doctor is in touch with the public health officers and all possible steps are being taken to check the spread of infection. Further expert medical opinion will be obtained if necessary. For the time being the school is in quarantine and all outside fixtures are cancelled. It is hoped to resume the normal school activities in about three weeks' time but in any event you will be informed when this can be done.

THE DISEASE AND ITS CONTROL

The following is the new section drafted for the *Code of Rules* under the heading of Poliomyelitis and Polioencephalitis.

Infectious Agent.—A specific filtrable virus.

Source of Infection.—Discharges from the nose, throat, and bowels of infected persons or articles recently soiled

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therewith. Infected persons may be recognisable paralytic cases, abortive cases, missed abortive cases, or persons in apparently good health, all of whom may be carriers.

Mode of Transmission.—By droplet spread from an infected person or carrier, by infection from their fæces, or indirectly by contact with articles freshly soiled with the nose, throat, or bowel discharges of such persons, and possibly by milk or food.

Incubation-period.—Usually 5–14 days, unlikely to be more than 21.

Period of Communicability.—Unknown: apparently not more than 21 days from the onset of the disease, but may precede onset of clinical symptoms by several days.

Methods of Control (the infected individual and his environment):

(1) *Recognition of the Disease.*—An acute infection with moderate initial fever; usually headache; sometimes gastro-intestinal symptoms such as vomiting and constipation; drowsiness alternating with irritability; hyperæsthesia; stiffness of neck and spine, usually accompanied by an increase in pressure and in the number of cells in the spinal fluid; tremor; and sometimes exaggeration of the muscular reflexes. Later, local diminution of reflexes and local motor weakness (paralytic). Any of these symptoms may be absent, but the diagnosis of the cases which are not at some time paralytic is so frequently uncertain that only paralytic cases should be counted officially as poliomyelitis in comparing rates, due precautions being taken in the other cases. Paralysis may be sudden and cause death within a few hours of onset by cessation of respiration.

(2) *Isolation.*—Of all cases for 3 weeks from febrile onset.

(3) *Immunisation.*—None.

(4) *Quarantine.*—Of exposed children of the household and of adults of the household whose vocation brings them into contact with children, or who are food-handlers, for 21 days from last exposure to a recognised case. Quarantine of 21 days should be observed for those exposed in the holidays.

(5) *Concurrent Disinfection.*—Cleaning.

Methods of Control (general) during an epidemic:

(1) Search for and examine all sick children especially those suffering from fever, aches or pains, upper respiratory infections, or intestinal upsets. These should be isolated pending diagnosis.

(2) Any member of the staff—i.e., the teaching and domestic staff—should be examined if there are any suspicious symptoms.

(3) Nose and throat operations should be postponed in the presence of an epidemic.

(4) Although organised games must continue, those of an exceptionally strenuous type should be forbidden.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JUNE 15

Notifications.—Infectious disease: smallpox, 2 (1 at Birkenhead, 1 at Bebington); scarlet fever, 866; whooping-cough, 1625; diphtheria, 262; paratyphoid, 4; typhoid, 7; measles (excluding rubella), 4415; pneumonia (primary or influenzal), 505; cerebro-spinal fever, 44; poliomyelitis, 12; polio-encephalitis, 0; encephalitis lethargica, 3; dysentery, 146; puerperal pyrexia, 134; ophthalmia neonatorum, 63. No case of cholera or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 4 (2) from measles, 8 (2) from whooping-cough, 1 (0) from diphtheria, 41 (6) from diarrhœa and enteritis under two years, and 11 (4) from influenza.

The number of stillbirths notified during the week was 230 (corresponding to a rate of 25 per thousand total births), including 32 in London.

BIRTHDAY HONOURS

THE second list of honours published on June 24 contained the following names of medical men and women.

O.B.E. (Civil)

ARCHIBALD BUCHANAN BARBOUR, M.R.C.S., A.F.R.Ae.S.
Lately commander and C.M.O., Air Transport Auxiliary.

JOHN CONSTABLE BROOM, M.D. St. And.
Acting director, laboratory of tropical medicine, Wellcome Research Institution, London.

Mrs. EVA COTCHING, M.B.E., M.D. Durh.
Lately deputy director, Iraq, Soldiers' Sailors' and Airmen's Families Association, Paiforce.

Surgeon-Captain ARCHIBALD FAIRLEY, M.B. Glasg., R.N. retd.
Principal scientific officer, Chemical Defence Experimental Station, Ministry of Supply.

GEORGE FOGGIN, B.A. Lond., L.R.C.P.E.
Principal school medical officer, Newcastle-on-Tyne.

FREDERICK JAMES SIMKIN HALL, M.B. Lond., F.R.C.S.E.
For services to ships lying off Deal, in the Downs.

ENEAS KENNETH MACKENZIE, M.D. Aberd., J.P.
Chairman, Ross and Cromarty Insurance Committee.

HUBERT TURNER PENN YOUNG, M.B. Edin.
Medical officer, H.M. Prison, Wormwood Scrubs.

M.B.E. (Civil)

ERIC WILLIAM BINTCLIFFE, M.S. Lond., F.R.C.S.
Senior surgeon, Ronkswood Hospital, Worcester, Ministry of Pensions.

Mrs. RUTH LANCASTER (née Darby), M.B. Birm.
In charge of the Military Families Hospital, Rumwood Court, Langley.

ROBERT CATHERWOOD WALLACE, M.B. Edin.
Admiralty surgeon and agent and medical officer, R.N. Armament Depot, Crombie.

ROFFEY PARK

THE OFFICIAL OPENING

IT is now just over two years since the first patients arrived at Roffey Park, the centre near Horsham established by the National Council for the Rehabilitation of Industrial Workers.[1] At the belated official opening on June 14 Lord HORDER, chairman of the council, said that in these two years over 700 have been treated; and the fact that there is now a waiting-list of 4–5 weeks was a good sign in that "industrial managers don't send their people to a place that doesn't deliver the goods." The number of firms now associated with Roffey Park was 178, and it was now adding to its treatment function a training function: anyone interested in its work would be able to come and stay and study that work in detail, and he hoped it would become a model training centre. There should, said Lord Horder, be a two-way traffic: while medicine could make a contribution to industry, industry could likewise make a contribution to medicine.

Mr. GEORGE TOMLINSON, Minister of Works, introduced by Lord Horder as chairman of the Tomlinson Committee whose proper name nobody could remember, said he thought the name was better forgotten; for it included the word "rehabilitation"—a word nobody liked and which he understood that doctors were trying to change. What mattered, however, was that the idea behind the word should sink home. At a stage of the war when boys and girls, grandfathers and grandmothers, had all been called into industry, there were still 200,000 regarded as unemployable. Within two years of beginning to think in terms of rehabilitation, 180,000 of these had been brought into the war effort—all through getting people to recognise *possibilities*. He thanked Lord Horder and Dr. T. M. Ling, the medical superintendent, for a great venture of faith—for a dream realised against the background of war. Perhaps, he thought, it could not have been realised except in war; for it was only then that people understood the importance of rescuing man-power. Today Roffey Park had ceased to be an experiment, but he had great faith in the further results to be gained from the two-way traffic of which Lord Horder spoke.

1. See *Lancet*, 1945, ii, 607.

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In England Now

A Running Commentary by Peripatetic Correspondents

Occasionally we read in our daily paper "THE LIFEBOAT STOOD BY ALL NIGHT" and we think, no doubt, of the gallant men of her crew, comfortably clad in oilskins and well lushed up with rum, anchored in the lee of the ship, smoking cartons of duty-free cigarettes passed down from above. I did till one day last winter when a trip in the lifeboat to render medical assistance got merged in an urgent call to a second ship on the Goodwin Sands. As we were about to land, distress rockets flamed up to call the boat urgently to the outer edge of the South Sand Head where a 9000-ton Victory ship had gone aground on the top of high water.

We made course due east straight across the Sands, now covered with water boiling like a cauldron and whipped up by a north-west gale. It was about ten o'clock on a pitch-dark night, and the ship with all her lights blazing stood out like a beacon with the rotating beams of the South and East Goodwin light vessels sweeping across her every half minute. Two red lights slung vertically from her triatic stay showed that she was "not under command." Very cautiously the coxswain took the lifeboat round the ship with the crew holding on with hands and feet as the mountainous waves rolled her in all directions. The waves breaking over the ship made it almost impossible to come alongside; and from the high bridge came the warning by signal lamp WE ARE AGROUND, followed by the inevitable query WHAT SHIP? We replied with my pocket torch—LIFEBOAT STANDING BY. It was obvious that no attempt at salvage could be made till the next high tide, about eleven hours later; meanwhile there was a considerable risk of the ship, with her crew of fifty, rolling over with the falling tide or breaking in half if the sand washed away from bows and stern—the age-old danger to any vessel on these treacherous banks.

This would mean immediate action if any of her company were to be saved, so the coxswain made course for some deeper water a few cables' length from the ship and dropped a light anchor. Even this meant a superhuman effort by five of the crew, who clawed their way forward and managed to cast over the necessary cable while the wind and waves tried to tear them from their hand-holds. Meanwhile the coxswain, astride the steering wheel, held the boat head on to the wind and tide on both engines. After a dog-fight lasting twenty minutes the bowman came aft to report that the anchor would not hold, and the order was given to raise it. Then we decided that our nearest safe anchorage was on the west side of the Sands about six miles from the shore, where the coxswain said we could lie snug for the night, It all depends what you mean by snug, and after crossing the boiling maelstrom of the Sands again, the twelve-fathom deep which the local men call Abraham's Bosom was certainly a shade quieter, and enabled us to get down the heavy anchor with many yards of six-inch cable. At last came the order STOP ENGINES and we swung head to the racing tide on the edge of Trinity Bay and settled down for the night. The ship, still with full lights, lay less than half a mile away and we could see every signal passing between her and the naval control in the adjoining anchorage.

The lifeboat, freed from the control of her propellers, stood on her head and tail as the fancy took her, while the seas swept across her open deck at irregular intervals and drenched the unwary trying to move about. Our coxswain, pulling himself stiffly from the wheel, made sure that all was ready for immediate casting off and posted a watch to give warning of any fresh danger to the ship. Then we broached the rations. A tin of sweet biscuits, another of sweet plain chocolate, and a pint bottle of rum appeared from the forward locker and were passed aft. It didn't seem very much among ten large men who had taken their last meal about seven hours before; with the warning that it might have to last for days, half a dozen biscuits and squares of chocolate were shared out by the second mechanic, who had wedged himself between two lockers. We crawled past him, one by one, and went away munching with one hand and holding on with the other, the biscuits helped down by unexpected mouthfuls of salt water appearing out of the surrounding darkness. The rum, measured out in two thick china mugs as opportunity occurred, went down the same way. Most of us would have sold our souls for a can of hot soup as the temperature dropped to freezing and our bodies stiffened in their cramped positions. In spite of oilskins the bitter north-west wind found every chink in our armour, and rubber boots did not prevent a steady numbing of the feet and legs as the night wore on. Any attempt to sleep, with relaxation of hand- or foot-hold, caused the victim to be slung across the boat on to some sharp obstacle, and the constant slap of the rudder with breaking waves and howling wind made conversation well-nigh impossible. After a few hours we lapsed into a kind of torpor broken by an occasional buzz of speech when somebody inspected the crawling hands of the clock. All our lights had been put out to save current, and the only break in the monotony was to read the signals from the ship. The last came at 1.30 A.M.—AM CLOSING DOWN GENERATORS PLEASE INFORM COASTGUARD.

The hours till dawn seemed to me to plumb the depths of human misery. One or two hardy souls tried to stamp about on deck and nearly got washed overboard for their pains; the remainder of us stayed wedged in our various crevices till cramp made a change of position inevitable. I heard an occasional grunt from the second coxswain, just convalescent from two months of sciatica; and one poor wight with influenzal bronchitis, who had coiled himself up in the chain locker, had frequent bouts of coughing till a wave broke inside and shut him up. But no word of complaint was uttered by any of the crew throughout that long night, and to my amazement the possibility of another night or more under these conditions was quietly accepted without comment. As dawn broke about 6.30 A.M., we hauled up anchor and returned to the ship. By now two salvage tugs had come up and we managed to carry their hawsers across to the ship, to be followed by thick towing cables as the tide rose to high water. Any attempt to board the ship was out of the question as the waves swept round her in both directions from bows to stern. No effort of the straining tugs at high-water peak could loosen the grip of the glutinous quicksands, and as the water fell the tugs cast off and moved away from the doomed ship. At low tide, six hours later, with a terrifying crack her back broke and the order came ABANDON SHIP; in twos and threes her crew jumped for safety to the lifeboat as time and again she came alongside. Packed like standing sardines and wet to the skin, they came ashore in safety. The lifeboatmen? They just spent the next hour getting the boat ready for another launch.

* * *

Unemployment among doctors, they tell me, has reached a new high. What with those who are sitting on the fence waiting for Mr. Bevan, those who, recently demobbed, hope to take memberships, fellowships, and other diplomata, and those who go the rounds from one hospital to another trying to get appointed to the staffs it is a wonder that the civilian patient (or should it be the patient civilian?) gets any treatment at all. As a member of the third group (still in uniform) for a fair time now I can speak with some authority and a little cynicism of hospital appointments. To generalise, one might say there are usually two jobs to be filled, that one will certainly go to the "temporary" holder, R.S.O., or what-have-you, and that the other is all but decided before the short-listed candidates present themselves to the committee. Sitting around awaiting interviews one gets to know one's competitors. "Didn't we meet at N——?": "Sorry you didn't get the job, but I expect we'll see each other again at B in July": "Oh, there's no point in putting in for G; its already arranged." But each time at least there is one competitor less.

I wonder why all the advertisements say, "Practitioners in H.M. Forces are invited to apply." Presumably because they have to; for let no-one imagine that the committees are prepared to wait for a serving doctor to be released, and the very mention of class B provokes an amused smile from the chairman. They have tried all that before and you can hardly blame them for appointing a chap who is available. Still, it makes a bit of a mockery of "equality." It is not enough, it seems, to be well qualified for a post: you have to be out of

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uniform. Which accounts for the pathetic cries of frozen specialists and the paradox that you cannot get out unless you have a job to go to; and cannot get a job unless you are out.

* * *

She had all the other obsessionals beaten hollow. She "infected" everything she touched, which hardly encouraged spontaneous behaviour. She drank her morning coffee but refused to put down the cup. "Look at that drip down the side of it. If I put it down it will infect the saucer." "What of it? They will both be washed." "But there will be germs on them." "But the soap and water will get rid of them." "Boiling water?" "Yes. Boiling water." "But does soap kill germs?" "Undoubtedly." "Don't you think it would be safer if they broke the cup and saucer?" "I assure you that won't be necessary." "But what about the water they are washed in? Won't that be infected?" "But that will go down the sink." "Where does it go? Won't it go into the food?" "Dear me, no! It goes into the sewage." "And into the river! So the whole town will be poisoned!" "Have no fear. It goes to a sewage farm." "Ah! A sewage farm!" Only then would she put down the cup.

We went on like that for over an hour. It was magnificent but it was not psychotherapy.

* * *

My friend, the morbid anatomist, was very depressed this morning. I am not surprised that a morbid anatomist should be depressed—on the contrary, it is wonderful to me that one who is constantly making postmortems can ever be cheerful. A surgeon or physician, or even a gynæcologist, sometimes makes mistakes, and the revelation at the autopsy often makes him sad for some time to come. But forever to be seeing the unsuccessful cases of others must have a concentrated depressing effect. Anyway on this occasion my friend could not keep his misery to himself. "They ought to be struck off the Register," said he. "To whom do you refer?" I asked with something of a self-conscious air. "Those doctors who do not make a proper examination of a patient," he replied. Then he unburdened himself. It appears that he had lately had to deal with a case in which no rectal examination had been made of a patient suffering from a cancer of the rectum, until the symptoms were very insistent and the growth quite inoperable. "Such neglect should be brought to book," he remarked. "By whom?" I asked. He did not answer. "Who is so free from blame that he can afford to accuse his professional brother?" I continued. "I don't know," he replied, "but somebody ought to do something about it, and the man ought to be off the Register." "In that case," I replied, "it is likely that within a comparatively short time there would be few men left on the Register."

I sympathised with him all the same. I have often been righteously indignant when the failure to examine a patient properly has resulted in the loss of a chance to save life. But there is probably no practitioner who at some time or other has not been guilty of some omission which directly or indirectly has led to the loss of a life. This may be a sad thought but it has to be balanced by the countless cases in which a life has been saved by prompt action. Unfortunately the morbid anatomist does not see these. The only remedy that I can suggest is for him to have a change of duty from time to time. Let him take charge of a ward full of patients for a month. He will then (we hope) have the joy of seeing the majority of patients going out of hospital at the opposite door from that which leads to the autopsy room, and the next time I met him I am sure there would be a smile on his face, unless. . . . Ah, no, it would then be his deputy who would be depressed.

* * *

A colleague who has done a good deal of work on the arthropod parasites of man found himself strikingly described in a journal as "Dr. X, that Cortez among the insects, ticks and mites." This article was later reprinted in a medical journal in one of the Indian provinces, where the passage now read "Dr. X states that Cortez found among the insects, ticks and mites." Perhaps Keats would have found himself improved by the addition of the letters "ing" if the full reference had been given.

Letters to the Editor

HOMOLOGOUS SERUM HEPATITIS

SIR,—Your valuable leading article of May 11 prompts me to report a recent instance, for it is clear that much remains to be learnt as to the nature of homologous serum hepatitis both from the study of individual cases and from experimentation.

CLINICAL RECORD

A 30-year-old tractor-driver was, on the afternoon of Dec. 1, 1945, crushed between his machine and a loaded trailer. The injuries amounted to fracture of both pubic rami with separation of left sacro-iliac joint, traumatic rupture of the bladder with hæmaturia, and an enormous hæmatoma over the right thigh and hip. In the local hospital he was transfused with a bottle of plasma and on the following day was transferred to the Worcester Royal Infirmary under the care of Mr. G. H. Marshall, to whom I am grateful for the clinical details.

Forty-eight hours after the accident there was heavy albuminuria with gross hæmaturia: myohæmoglobin could not therefore be detected. It was considered possible that a crush syndrome would develop: the blood-urea on the third day was 47 mg. per 100 c.cm., plasma chlorides 526 mg., serum inorganic phosphate (expressed as phosphorus) 1·3 mg., and serum potassium 20·6 mg.

By the 5th day the blood-urea had risen to 84 mg. per 100 c.cm., but on the 7th day it had fallen to 49 mg. The hæmatoma increased in size and on the 14th day exuded copiously through the skin at first a bloodstained serous, and on the 18th a purulent, discharge containing *Staphylococcus aureus*. On the 19th day there were signs of a left-sided basal lobar pneumonia but both the septic hæmatoma and the pneumonia cleared with systemic penicillin. A left-sided femoral phlebitis was detected on Jan. 6 but this soon disappeared. By Feb. 23 he had good bony union and was able to walk satisfactorily.

At times during his stay in hospital he was morose, but on March 1, the day of discharge, he was noted to be in good health both physically and mentally: in fact on the previous morning he had danced a jig in the ward while his bed was being made. On arrival home he played with the children in the house but at 6.30 P.M. he said he would go to bed. During the night he vomited and became so ill that the doctor was summoned at 5 A.M. Gastric and general sedatives were prescribed with some temporary improvement. The same evening he became drowsy and when seen at 11 A.M. on March 3 he was in coma and the doctor noted that he was jaundiced. He was readmitted to the Worcester Royal Infirmary at 9 P.M. in a state of advanced cholæmia with a dry coated tongue and died at 3.25 A.M. on March 4, 57 hours after the commencement of the illness.

The ward sister was positive that his condition on the morning of discharge was good, but she admitted that during the previous night he had been reported as having "vomited very slightly." As, however, one other patient had done the same and three had complained at the same time of acute nausea, she attributed this to "something going round," there having been other instances of minor illness in the hospital about this time. The possibility of food-poisoning was investigated with negative results, whilst an analysis of the organs ordered by the coroner did not disclose any poison.

POSTMORTEM FINDINGS

The *necropsy* revealed a shrivelled liver of firm consistency weighing 912 g. with a wrinkled capsule. On section it was dark, owing to bile staining, but mottled with pale yellow pinpoint areas giving the impression of a nutmeg liver, except that the pattern was finer. There were no hæmorrhages.

The gall-bladder was slightly collapsed and contained only a greyish muddy material but no cellular elements or bacteria; the common bile-duct was patent. Other changes amounted to well-marked jaundice, especially of the face; injection at the lower end of trachea and in both bronchi; well-marked congestion of the lower œsophagus, fundus of stomach and duodenum, where there was some bloodstained mucus; left lung closely bound down to the chest wall and generally congested; in the right lung two recent infarcts at the base of an otherwise congested lower lobe, the upper lobe showing œdema; heart a little dilated and muscle soft and pale but no free fluid in pericardium; spleen slightly enlarged, pale,

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and diffluent; kidneys of normal size with very pale cortex but pyramids by contrast standing out vividly dark red; bladder small and very thin walled so that superior surface was easily torn when separation was being effected; much callus at site of fracture making dissection of urethra impracticable. No thrombus in veins of lower extremities.

Histological examination of the liver showed complete disruption of the columns with widespread necrosis of the hepatic cells, more particularly in the central zones, where the stricken cells were swollen prodigiously and vacuolated, the nuclei being either swollen, double or absent. Others of the cells, better preserved than the rest, were loaded with bile pigment, especially in the mid-zone of the lobules. The bile-ducts, by contrast with the parenchymal cells, were relatively normal and stained clearly. In the portal zones there were round cells and histiocytes in moderate numbers but almost no fibroblasts.

The other organs showed very little departure from normal, especially in view of the intensity of the clinical cholæmia. In the kidneys there was intense congestion of the glomeruli and a widespread fatty change in the tubules; in the lungs, apart from the infarcted areas, occasional sizable perivascular masses of lymphocytes with a few plasma cells and histiocytes; in the tongue patchy round-cell infiltration surrounding certain of the secretory glands; and in the ileum, swelling of the lymphoid follicles.

The latent interval of 90 days (it is perhaps inept to call it the "incubation period") is in keeping with that reported in instances of homologous serum hepatitis following the administration of measles [1] convalescent serum and mumps [2] convalescent serum, after inoculation for yellow fever,[3] after blood and plasma transfusion,[2 4-7] from contaminated syringes,[8-10] and experimentally produced.[11] The variation in the latent interval of this disease is striking, and Findlay, Martin, and Mitchell have shown that individual susceptibility may be the principal cause of it. It would be interesting to know if the same variation in the latent period occurs in the fatal cases.

No other case of infective jaundice had been known in the hospital for a year past, and as syringes and laboratory needles are sterilised by dry heat at 160° C for one hour, the plasma alone could be incriminated. But since the inquest a resident doctor has returned to duty who went off ill on Feb. 8 with "catarrhal jaundice." Although she had on a few occasions been in the patient's ward she had never been near him. If, however, the patient was infected from her the incubation period would have been 21 days or more (Findlay et al. give 20–40 days or more). Although epidemic hepatitis can prove quickly fatal, this man's illness is more in keeping with the disease we know as homologous serum hepatitis. The course of the illness in this patient however was unusually rapid even for homologous serum hepatitis, although Steiner's [7] fatal case died in two days after a latent period of 66 days.

After the publication of the inquest proceedings, a dentist sent an account of his personal experience of severe hepatitis developing 95 days after a serious ski-ing accident. He received no transfusion and his medical advisers were puzzled to know how he had acquired his jaundice. He may of course have been infected by a syringe or may have "caught" epidemic jaundice in the ordinary way, but he himself reckoned as one of the ætiological factors a large hæmatoma, the absorption of which he contended might damage the hepatic cells. Can "overloading" the liver predispose a patient to a more severe form of homologous serum jaundice than he would otherwise have had? Is there any evidence to show that the mortality is higher in those who have absorbed much blood (whether from a hæmatoma or multiple blood-transfusions) or who have lost much protein? Bile pigmentation was heavy in this liver by comparison with that from a fatal case of jaundice following the administration of measles convalescent serum, and the hæmatoma was a large one.

Homologous serum jaundice seems to be a real if remote risk attending transfusion or inoculation of human whole blood, plasma, or serum for whatever reason it is given. If, however, treatment is resorted to only in real necessity, the risk is fully justified. Because plasma is prepared from pooled blood there would seem to be, prima facie, a far greater danger attending its use than there is with whole blood, proportionate perhaps to the size of the pools, although the recommendation of Loutit and Maunsell [12] to reduce the size of the pools goes some way towards lessening it. The value of plasma has been clearly established and countless numbers of war casualties owe their lives to its use, but should it be proved that the risk of jaundice is greater with plasma than with whole blood, then plasma should only be employed when strictly indicated and where whole blood is either considered unsuitable or is impracticable. At a time when a great increase in road casualties is to be expected any hazard of plasma transfusion should be made widely known. The lighthearted employment of plasma as a superior substitute for saline is to be strongly deplored. It is essential, when blood or plasma is used, that the numbers of all bottles be entered up on the patient's notes, for only in this way can one hope to identify a carrier and recall a batch of icterogenic plasma.

The long "incubation period," and the fact that the disease is so often mild, make its frequency hard to assess. It is almost certainly commoner than we think, although in January, 1943, the number of cases known was only 12.[2] Two other fatal cases have been seen in this area in the British convoys arriving soon after D-day, and other instances of post-transfusion jaundice occurring weeks after the accident have been noted, but, because they were largely symptomless, little attention has been paid to them.

The question arises whether all cases of infective jaundice should be notified so as to facilitate the compiling of statistics on the epidemiology of epidemic hepatitis, homologous serum hepatitis (if indeed it should prove to be a separate entity), and that other sinister infection —spirochætal jaundice. There are obvious difficulties here, for examples of subclinical jaundice are certainly common,[13] whilst not all cases of febrile jaundice are infective in origin any more than are all patients with infective jaundice febrile; in short the accuracy of the notifications would depend upon the clinical acumen of the practitioner. But a close watch needs to be kept for the onset of homologous serum jaundice: it is not enough to say, as in the case just described perhaps, that one has insufficient evidence to establish the diagnosis. Only in a minority of instances will it be possible to prove its specific origin. But until every possible case is investigated we shall have no precise knowledge as to its frequency or its true nature. The mortality in some outbreaks of this disease leaves no room for complacency.

Worcester. W. H. McMENEMEY.

1. Ministry of Health Memorandum dated June 29, 1942.
2. Ministry of Health Memorandum, *Lancet*, 1943, i, 83.
3. Findlay, G. M., Martin, N. H., Mitchell, J. B. *Ibid*, 1944, ii, 301, 340, 365.
4. Beeson, P. B. *J. Amer. med. Ass.* 1943, **121**, 1332.
5. Bradley, W. H., Loutit, J. F., Maunsell, K. *Brit. med. J.* 1944, ii, 268.
6. Morgan, H. V., Williamson, D. A. J. *Ibid*, 1943, i, 750.
7. Steiner, R. E. *Ibid*, 1944, i, 110.
8. Beattie, J., Marshall, J. *Ibid*, 1944, i, 547.
9. Darmady, E. M., Hardwick, C. *Lancet*, 1945, ii, 106.
10. Howells, L., Kerr, J. D. C. *Ibid*, 1946, i, 51.
11. Paul, J. R., Havens, H. P., Sabin, A. B., Philip, C. B. *J. Amer. med. Ass.* 1945, **128**, 911.
12. Loutit, J. F., Maunsell, K. *Brit. med. J.* 1945, ii, 759.
13. Pollock, M. R. *Ibid*, 1945, ii, 598.

FOLIC ACID AND DIARRHŒA

SIR,—The article by Dr. Carruthers in your issue of June 8 suggests that folic acid may be the long-sought key to an understanding of infantile diarrhœa and vomiting. The resistance of this so-called enteritis to chemotherapy, the dependence of the disease on diet, and the tendency to relapse with richer diet indicate a nutritional factor complicating the infection. The striking effect of folic acid on a variety of infections causing diarrhœa in adults shows that a common nutritional disturbance is involved in these infections—a disturbance curable by a vitamin whose effect on the intestine is precisely the opposite to the peristaltic effect of thiamine and of inositol.

I hope that the Lederle Laboratories will supply research-workers with samples of folic acid sufficient to allow them to explore this possibility.

London, W.9. R. L. WORRALL.

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C.CM. OR MILLILITRE?

SIR,—Some of your contributors refer to the cubic centimetre as if it were the thousandth part of a litre. This is not correct; the thousandth part of a litre is the millilitre. The litre is not the volume of a cubic decimetre, nor is the millilitre the volume of a cubic centimetre.

When the metric system was devised by an international commission in 1799 the unit of volume, the litre, was defined as a cubic decimetre, and the unit of mass —the kilogramme "of the archives," as it was called— was defined as the mass of a cubic decimetre of water at maximum density. Later it was found that masses could be compared with a higher degree of accuracy than that with which volumes could be determined, and therefore it was preferable to have a material standard of mass specifically defined rather than one defined from the unit of length through the unit of volume. Accordingly, in 1889, the International Bureau of Weights and Measures introduced the international prototype kilogramme, instead of the kilogramme "of the archives," as the standard of mass, and the litre was afterwards redefined in terms of the standard of mass as the volume of a kilogramme (prototype kilogramme) of water at maximum density. The litre so defined was found to be slightly larger than the cubic decimetre and it follows that the millilitre and cubic centimetre differ from one another in the same proportion. Consequently the cubic centimetre is not an alternative to the millilitre and should never be used as such.

In conformity with these considerations all glassware measures used for scientific purposes are, or should be, graduated in litres and millilitres. These units of capacity are also used in legal enactments such as the statutory rules and orders of the Ministry of Health dealing with definitions and standards for "designated" milks and the prescribed procedure for examining these milks.

London, S.W.7. J. M. HAMILL.

PENICILLIN IN GENERAL PRACTICE

SIR,—A type of case which causes the general practitioner considerable anxiety is the spreading superficial infection breaking through the body defences. Established general infections (septicæmia, pyæmia) are treated institutionally; the minor, localised lesion subsides on minimal or no treatment with the patient ambulant: in neither instance has the G.P. an intimate cause for concern. But the spreading superficial infection, with its threat to life and limb, is the G.P.'S responsibility and demands prompt efficient treatment and close supervision. Examples of these worrying cases are "septic hands" with lymphangitis, infected abrasions with lymphadenitis and fever, and boils in the "danger area" of the face. Chemotherapy has played an important part in combating these infections and has much reduced the period of incapacity. Penicillin promises even more favourable results. Unfortunately three-hourly intramuscular injections are impracticable for the busy G.P., who, treating his case at home, has no-one to whom these injections can be safely entrusted. Nor can he afford the time to administer the injections himself. These cases therefore are either admitted to an already overworked hospital for penicillin or are treated at home with or without the sulphonamides. In the latter contingency, the uncertainty, delay in resolution, close supervision, and the time off work are a continued worry and anxiety for patient and practitioner alike. An impasse appears to have been reached which can only be broken by the provision of a penicillin preparation or method of administration producing a therapeutic blood-concentration on infrequent doses. In an average practice the optimum would be the single daily dose, while the limiting frequency of doses would be twice daily (twelve-hourly).

In attempting to elucidate the problem it seemed to me that if the invading organisms could be temporarily eradicated, the initially overwhelmed body defences might then be sufficient to effect localisation and cure. Fleming et al. (*Lancet*, 1944, ii, 621) have demonstrated a detectable concentration in the blood four to five hours after the intramuscular injection of a single dose of 50,000 units of penicillin. Two such doses daily, it was hoped, would suffice to tide the body defences over the critical period, while the danger of producing penicillin-fast organisms or of encountering penicillin-resistant strains could be countered by close clinical supervision and early resort to chemotherapy. With the close supervision possible in this experiment, no detriment to the patient would be involved and it was therefore considered justified.

Alternate cases (odd numbers) were treated with 50,000 units of penicillin twelve-hourly and rest in bed. Controls (even numbers) were treated by rest in bed and sulphathiazole. The penicillin was dissolved in *N* saline (100,000 units in 5 c.cm.) and administered by intramuscular injection. Full doses of sulphathiazole (2 g. on admission; 1 g. four-hourly for thirty-six hours; and then 0·5 g. four-hourly) were given to the controls. Only those cases were chosen which showed clinical evidence of breakdown of the body defences and which would normally have warranted bed rest and chemotherapy.

Results have been so striking that, even though the series is so small (20 cases; 10 penicillin and 10 sulphathiazole controls), a report seems justified. The average period of invalidity (time off work) was reduced from 6·7 days for the sulphathiazole controls to 2·8 days for the penicillin-treated cases. Although definite conclusions cannot be drawn from so small a series, the reduction in time "off sick" warrants a trial of the method with a view to more accurate assessment of its value in the type of case indicated. A further cogent reason is the extremely rapid regression of the patient's symptoms and signs and with them the G.P.'S cares and anxiety.

Leeds. P. D. BEDFORD.

TREATMENT OF ACUTE OSTEOMYELITIS

SIR,—Mr. Aird has objected to our account of Mr. McAdam's paper on acute osteomyelitis, stating that "in each of the 10 patients who suffered a spread of infection to a joint the septic arthritis was present when the patient first came under treatment, and infection did not in any case spread to a joint after treatment was begun." We find it difficult to reconcile this remark with the data published by Mr. McAdam, and would like to quote two of his sentences on which we based our statements.

1. Under the heading Local Response to Treatment, McAdam wrote "In 10 of the 40 patients septic arthritis occurred," not "had occurred," and later in the same paragraph he mentions that "in 4 patients, as the limb was incorporated from the first day in plaster-of-Paris, a septic arthritis was not diagnosed." If the joint infection was not diagnosed as present before treatment was begun, and was present after it, we wonder on what basis it can be affirmed that the infection did not spread to the joint after treatment was begun.

2. In the chart accompanying the article, and headed Details of Treatment, no mention is made of the septic arthritis in the columns dealing with the condition on admission, but under the column of Complications "sinus present on admission" is mentioned, but "septic arthritis" is recorded in 10 cases without referring to the pre-existence of the complication.

From all this we do not see how the facts given by Mr. McAdam can be interpreted in another sense than that given in our paper.

Wingfield-Morris Orthopædic Hospital, Headington, Oxford. J. TRUETA. M. AGERHOLM.

ACUTE BENIGN DRY PLEURISY

SIR,—I was especially interested in Dr. Scadding's article of May 25 because I have seen over twenty cases of "Bornholm disease" here within the last six weeks. Sporadic cases appeared at the end of April, and the outbreak, which reached a peak towards the end of May, now appears to be subsiding.

The general features of the illness were as described by Dr. Scadding, but it appears to have been milder. Fever almost always ceased within two days and symptoms usually disappeared within five days. Four relapses were seen, one on the opposite side to the initial attack. The most constant physical sign was tenderness on upward pressure under the costal margin on the affected side. Diminished movement was occasionally seen. Pleural friction was heard in only 1 case, a febrile relapse; but most patients were not auscultated after the first

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day. In two-thirds of the cases the pain was right-sided. One Indian patient developed a painful, swollen wrist on the fourth day which subsided completely by the eighth day. No other complications were seen.

White-cell counts were done during the first two days in 6 cases, and 4 showed a definite leucopenia. Blood sedimentation was estimated in 4 cases and in all of them was raised (12–38 mm./hr.). Two patients were screened on the day after admission and in both of these diaphragmatic excursion was normal and the costophrenic angles were clear. Lumbar puncture was done in 1 case and produced a normal fluid, but it is interesting that 3 cases of very mild lymphocytic meningitis were admitted during May—the first cases recorded in this hospital for many months. In contrast to Dr. Scadding's findings, only 1 patient in this series was an officer. There was not an undue proportion of cases from any one unit in the area.

Few conditions are easier to diagnose clinically if the possibility of the disease is remembered. The pain, by its widespread distribution, with tenderness in the hypochondrium, does not resemble the more sharply localised pain of an early pneumonia, and febrile symptoms are less prominent. Its essentially pleuritic character will usually exclude an abdominal emergency, and the rapid fall in temperature excludes amœbic hepatitis. I consider that the condition is best described as "acute epidemic diaphragmatic myalgia."

92 (Br.) General Hospital, C.M.F. P. C. REYNELL.

CÆSAREAN SECTION

SIR,—On p. 890 of your issue of June 15 is an account of a paper on the lower-segment cæsarean section which I read before the North of England Obstetrical and Gynæcological Society at Newcastle on May 3. The gross maternal-mortality figure is incorrectly stated in your columns as 3·4%. This figure should be 1·4%, representing a total of 7 deaths in the series of 500 operations.

Newcastle-on-Tyne. STANLEY WAY.

LACTOGENIC PROPERTIES OF THYROID

SIR,—It is now well known that thyroid feeding affects milk secretion. Last year the *Journal of Endocrinology* devoted a whole number (no. 3 of vol. 4) to a discussion of this phenomenon and the allied observation that iodinated casein can be substituted for thyroid. In the historical review of this subject, which has appeared in several papers, credit has invariably been given to Dr. W. R. Graham, of Canada, working under the direction of Prof. H. D. Kay, for making the original observation.[1]

While investigating the effect on basal metabolism of milk from cows fed with iodinated protein I came across references to a paper by E. Hertoghe quoted by Lukacs [2] concerning the effect of thyroid on milk production. In my review of the literature in the *Journal of Endocrinology* [3] I drew attention to the early work of Hertoghe and stated that "at present I cannot trace this paper of Hertoghe's referred to by Lukacs," but through the kindness of the librarian of the Royal Society of Medicine, who obtained from America a microfilm copy of Hertoghe's monograph translated into German by Spiegelberg,[4] and Mr. Frisch, of Guy's Hospital medical school, Hertoghe's original paper [5] was finally traced. In this paper, published in 1896, Hertoghe draws attention to the action of thyroid on women during lactation, showing that it caused the breasts to swell and the milk to become more abundant. This relation between the thyroid and the mammary glands led him to extend his observations to cows. He writes:

"We give here the results of a most convincing experiment which we were able to carry out at the school of the Government Dairy Farm at Bouchont. . . .

"We selected as experimental animal a cow which was to calve by mid-June. This cow had yielded during fifteen days preceding the administration of thyroidine a daily average of 11·5 litres of milk.

"On March 9 we gave 1 g. of thyroid gland—fresh, from sheep—per 70 kg. of body-weight; therefore for this cow, which weighed 479 kg., the dose was 6 grammes per day, corresponding to 18 English tablets. On March 16 this dose was doubled. The following table shows that, beginning with the third day of administration of thyroid, the milk yield was increased. The daily yield increased from 11·5 to 12, 13·5, 14·5, and 15·5 litres, thus at the height of the increase exceeding the average yield by 4 litres—viz. 30% of the total yield."

These observations by Hertoghe on the lactogenic properties of thyroid in cows, apparently not followed up, appear to have anticipated some of the subsequent work on this subject.

J. DOUGLAS ROBERTSON.
Courtauld Institute of Biochemistry,
Middlesex Hospital Medical School.

1. e.g., *J. Nutr.* 1934, **7**, 407.
2. Lukacs, J. *Arch. Kinderheilk.* 1930, **91**, 9.
3. Robertson, J. D. *J. Endocrinol.* 1945, **4**, 300.
4. Die Rolle der Schilddrüse bei Stillstand und Hemmung des Wachstums und der Entwicklung und der Chronische gutartige Hypothyreoidismus. Munich. 1900.
5. *Bull. Acad. Méd. Belg.* 1896, **10**, 382.

QUALIFICATIONS OF THE SPECIALIST SURGEON

SIR,—As a young surgeon practising in one of the special branches, may I make some suggestions about the postgraduate qualifications which it is obligatory for a specialist surgeon to obtain? Most letters and articles on this subject are by senior members of the profession, and I fancy they are inclined to forget what the present struggle for higher qualifications amounts to—namely, the retention for a few weeks of vast quantities of detailed factual knowledge, most of which is quite useless to the surgeon, illustrates no special principle, and is mostly forgotten in 10 years, if not in 10 weeks. Lest any cry "sour grapes," I will add that I hold a fellowship and a special diploma; and also that I am under 30.

The position at present is generally as follows:

In London, would-be specialist surgeons must have the F.R.C.S. or a M.S., or both.

In Edinburgh and elsewhere in Scotland they must have the F.R.C.S.E.

Elsewhere they will usually require the F.R.C.S. or F.R.C.S.E. or a special diploma, or both.

The F.R.C.S. is generally held to have more value than the F.R.C.S.E. taken in the appropriate specialty, plus a special diploma—a ridiculous state of affairs.

Supporters of examinations such as the English fellowship claim that these test the grasp of general principles and exclude people with "the narrow specialist mentality." In practice they do no such thing; they are largely tests of memory, examination technique, and the grit to do the essential swotting. The unlucky candidate may be examined by a specialist in a different field, who gives him a stiff examination in the technicalities of his own specialty. For the primary examination for the English fellowship detailed anatomy of the whole body must be known. The Edinburgh fellowship, though much fairer to the specialist, still demands extensive knowledge of general surgery with emphasis on Edinburgh methods and opinions.

Of what value is detailed knowledge of the anatomy of the limbs or of herniæ to an E.N.T. or eye surgeon? Why ask a gynæcologist about recurrent dislocation of the shoulder and the operations for its cure? Why question an orthopædic surgeon on carcinoma of the alimentary tract? Why ask an E.N.T. surgeon about spondylolisthesis or the surgery of renal calculi? No E.N.T. specialist is fit to operate on a hernia or treat a fractured limb or give an opinion on an abdomen 5 years after passing the F.R.C.S., so why teach him in the first place?

Those who do not believe in specialists and prefer "a good general surgeon" forget how much there is to know nowadays. However gifted and hard-working, the surgeon who operates on almost every region of the body ought to confine himself only to the commonest diseases, if he is to diagnose and deal with them efficiently and on up-to-date lines.

I propose for potential specialist surgeons—whether E.N.T., orthopædic, neurological, or obstetric and gynæcological—one examination in three parts, acceptable throughout the British Isles as academically qualifying them for any post in their specialty. A detailed syllabus should be published, and examiners should be intelligently selected—no more orthopædic surgeons examining gynæcologists and genito-urinary surgeons examining otologists.

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Part 1 should include a stiffly marked paper and "viva" by a pathologist. Certain textbooks might be recommended.

Part 1.—This should cover those general principles of physiology, pathology, bacteriology, surgery, and therapeutics which the general surgeon (perhaps with some truth) accuses the modern specialist of forgetting. It should include the general pathology of such ubiquitous diseases as tuberculosis, syphilis, and neoplastic disease, the principles of chemotherapy and antibacterial agents, and of the healing of wounds.

Part 2 should cover the detailed anatomy and physiology of the special region, experimental laboratory work of practical value, and embryology and comparative anatomy—thus corresponding roughly with part 1 of the examination for some special diplomas.

Part 3 should cover the pathology and surgery of the special areas concerned, and more general knowledge of certain systemic diseases—for example, cardiorenal disease for the ophthalmologist and central nervous system disease for the otologist. This approximates to part 2 of the examination for some special diplomas.

General surgeons would have a similar examination; but special regions and branches, including orthopædics, would be excluded.

Part 1 should not be taken till about a year after qualifying, and admission to part 3 should not be permitted unless the candidate has to his credit 1–3 years of postgraduate work in a special department.

This examination would make it possible to reduce the considerable time wasted by medical students in cramming detailed anatomy, while the prospective specialist would not spend time on useless facts and theories: his teachers would know how to help him, and where his real interests lay.

London. SPECIALIST-SURGEON.

ANÆSTHETIC FILMS

SIR,—Films for medical instruction have been and are being made at a much smaller cost than the expensive ones discussed by Mr. Rogerson in his letter of June 8. For example, groups of short silent films are needed to be used as animated illustrations to lectures. This is indicated by the replies given to our questionnaire by the deans of medical schools and the tenor of the papers and discussion at the meeting held at the Royal Society of Medicine in February (*Lancet*, March 16, 1946, p. 383). Films of this type can be made for £100 or less, an expenditure well within the range of a medical school. The field to be covered is so large that there is scope for sponsorship by individuals, medical schools, philanthropic trusts, industry, and Government departments.

RONALD MACKEITH
Chairman, Medical Committee, Scientific Film Association

London, W.1

EX-SERVICE DOCTORS

SIR,—As Service specialists shortly to be demobilised, we are much concerned at the fate of those who have preceded us, and are grateful for the public exposure of their difficulties recently made in your columns. From personal experience, we already know that the picture you draw of prospects for the demobilised doctor is far from exaggerated, and not only in our own interests hope that positive action will speedily be taken to improve the situation.

Whilst agreeing that the solutions you propose—a Government subsidy to existing hospitals and overworked general practitioners for extra staff and assistants—would go some way to solving the problem, especially if these subsidies were made in the most needy areas, we feel that administrative difficulties might in some cases obstruct such a plan, which does nothing to provide for new development areas, nor for those already backward in their medical services before the war.

It seems to us, therefore, that what is needed is a beginning, now, on the provision of new hospitals. For this purpose we believe existing accommodation, such as disused Service establishments with their equipment, could in many cases be found. Such a project should be financed, staffed, and run by the Government as an interim device to bridge the gap until the regional boards take over the hospitals. In the same way, local authorities in the worst-served districts should be empowered to provide, by adaptation or new building, health-centres in which intending general practitioners released from the Services could work, within the National Health Insurance framework. Government subsidies should be available for such doctors where necessary.

We believe that only by such direct Government action can the present plight of many doctors, and those who need their services, be remedied, and that not only ex-Service medical officers would welcome such a transitional phase before the introduction of the new service.

JOHN B. ATKINS.
H. L. M. ROUALLE.
P. F. FLETCHER.

R.A.F. Hospital, Ely.

SIR,—Your leading article, "Interim" (June 8), was welcome and well timed. One class, to which I happen to belong, has, however, been overlooked. The registrar-type appointments, originally designed for those who "wish to be specialists," all pass to those who have been specialists in the Forces or have already obtained higher degrees. I myself have always sought to specialise in pædiatrics. I qualified in 1939, and a year later joined the R.A.F., in which I served for nearly six years; during this time, detached as I was from opportunities for clinical work in hospitals, it was impracticable to work for higher qualifications. Now, after demobilisation, the only type of appointment open to me is a junior post at £350 a year for six months. At the end of that time I intend to take the D.C.H.; and the next problem will be to work for the M.R.C.P. while still meeting family commitments. If I am forced to go into practice to obtain a home and a living, I feel that I shall once again have fallen out of the running. In view of the pressing need for specialists in the National Health Service, it seems that the criteria for the encouragement of specialisation are too narrow. CLASS I.

INACTIVE HORMONE PREPARATIONS

SIR,—It is to be regretted that, at the Medical Exhibition in Glasgow, inactive hormone preparations for oral administration are still advertised. The knowledge of endocrine medicine among the majority of the profession has, in the past, largely been influenced by advertisements and circulars from the manufacturing firms, and much of the disrepute into which this branch of medicine has fallen has been due to failures in therapy through the misapplication of useless and expensive remedies, purporting to cure anything from impotence to prostatic hypertrophy.

The correct application of genuine active and standardised hormones in adequate doses for suitable conditions will effect results of great value, and the advances in endocrine biochemistry, in which this country holds a prominent position, warrant a greater interest and recognition of endocrine medicine.

Clinical material is abundant in any big hospital in medical, surgical, and gynæcological departments, and if only this material were coördinated on a sound basis, backed by adequate laboratory facilities, advances in knowledge would be bound to follow. Such developments, without adequate experience and coördination, will be slow.

The recent formation of the endocrine section of the Royal Society of Medicine and the Society for Endocrinology is a sign that at last those interested in the subject are determined to seek progress, and the profession has shown signs of recognition by the appointment of an endocrinologist to the teaching staff of a London hospital.

Let us clear the decks for action. It behoves all reputable manufacturers to scrap their useless preparations now; by so doing they will play their part in casting aside finally the mantle of quackery and suspicion which has so long enshrouded this important branch of medicine.

Bristol. GEORGE L. FOSS.

A GENERAL meeting of the Medical Society for the Study of Venereal Diseases will be held at 11, Chandos Street, London, W.1, on Saturday, June 29, at 2.30 P.M. A discussion will be held on Treatment of the Infected Female with Penicillin.

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Parliament

ON THE FLOOR OF THE HOUSE

ON the first day of the reassembly of Parliament after the Whitsun recess there was a first-class ding-dong political debate on agricultural food-production. There are shortages of foods in Europe, in India and China, in the Near and Middle East, and even in North and South America, and there are also shortages in Great Britain. But the speeches of the Opposition ascribed the British shortages to the action of the present ten-month-old Government, while the world shortages were attributed to war, droughts, tempests, and perhaps even wrong food policy.

The real seriousness of the situation arises from the fact that nothing which can be done in this country will directly increase the world food harvests for the next few months. World stringency will continue at least until the 1947 harvests are gathered, and probably until 1948. Mr. Strachey, the Food Minister, in a broadcast before his departure for Canada to sign a new wheat agreement, acknowledged the dull monotony of our diet and hoped for more variety. More power to his elbow!

The other days this week were occupied with plodding and serious discussions of the Finance Bill and with work in committee on civil aviation and on the National Health Service Bill, which will be ready for report to the House early in July and will have reached its third reading before the summer recess.

Mr. Aneurin Bevan's agility—and flexibility—in the committee debates is the admiration of all beholders. He gives on occasion the soft answer which turneth away controversy, and on others the swift retort that is out almost before the critic has finished speaking. During these committee debates such questions as the position of the assistant are being clarified and by the time this stage is over some of the obscurities of the new medical structure should have been eliminated. But it is becoming obvious that we need a clear explanation of how the individual doctor will stand when the Bill is law. There is certainly no acute shortage of civilian medical man-power now, and recent advertisements of posts have brought in many applicants. The sooner doctors know more definitely what their position is to be the more rapidly the preliminary difficulties of the new service will resolve themselves. But no statement can be made till at least the committee stage has been completed.

MEDICUS, M.P.

THE HEALTH BILL IN COMMITTEE

When the committee met on June 19 the discussion on Mr. Richard Law's amendment on the remuneration of practitioners was continued. Mr. H. LINSTEAD, although opposed to payment by salary, could not see that it would make much difference for many years to come. Owing to the shortage of doctors, he thought all doctors would find they had all the patients they were allowed to take. But the real question was how far we wanted the doctor to be independent. Once the medical profession became essentially a profession of salaried State servants quality would suffer.

CAPITATION FEES *v.* SALARY

Mr. SOMERVILLE HASTINGS hoped that the Minister would not fix any hard and fast rule as to remuneration and salaries under the new service. At the moment he thought payment partly by salary and partly by capitation fee would be most popular among doctors. But the time would soon come when most doctors would wish to be paid by salary. The advantage of capitation was that it enabled a doctor to build up goodwill, which in the past had been saleable. But in the new service goodwill would not be saleable, and that paramount advantage would disappear. Capitation also seemed to him to give the patient too much power over the doctor. The white-paper stated that doctors might, if they wished, see their patients in health centres. Mr. Hastings thought that the public would so wish, but he was not so sure about the doctors. The capitation fee would give the public an easy means of exerting pressure on doctors to go into health centres. The Spens report had shown, perhaps rather surprisingly, how much greater was the income of the doctor in his vigorous middle age than in his later years. If that was to go on, and it seemed to be the right thing, capitation fees were admittedly a convenient method of achieving it. But, Mr. Hastings suggested, an equally good method would be to allow the older doctor to reduce his number of patients and accept a proportionate salary.

Sir HUGH LUCAS-TOOTH held that in so far as doctors were salaried they became servants of the State, for though their actual contracts were with an executive council, that council was an organ of the State. Mr. BEVAN interjected "What constitutes a servant's relationship to his master is the day-to-day supervision and not the remote and abstract relationship of the State." The executive councils would be responsible for the supervision of the practitioner service. Sir HUGH agreed but held that the ultimate power would flow from the central executive. A question of such magnitude could not be settled in detail by the passing of the Bill, but he thought it incumbent on Parliament to give some general ruling to be incorporated in the Bill. Once the salary element was introduced he thought it would become popular with the doctors, and the basic salary would not remain fixed, but there would be demands for increases and a reduction of capitation fees.

Dr. STEPHEN TAYLOR admitted that he had been in favour of a whole-time salaried service, but the Spens report had made him feel that there was a lot to be said for having a capitation fee to allow older doctors, if they wished, to cut down their work. Also, provided that patients could learn to recognise a good doctor—as they did not always do—there was much to be said for their playing a part in deciding how much a doctor should get. The amendment recognised one of the uses of the basic salary—enabling emoluments to be increased in under-doctored areas. It was also something to which an addition could be made for objective criteria such as higher qualifications, age plus length of service, or attendance at refresher courses. If an outside body were to assess a doctor's capacity, and award him a higher basic salary, Dr. Taylor thought there would be a real danger to his professional integrity, because it would involve his setting out to please someone other than his patients. Dr. Taylor also felt they must guard against appointing senior doctors, junior doctors, and "middle" doctors. There was a danger that the sliding capitation fee might discourage doctors from playing their full part in the State service. A doctor reaching the upper limit on his list might refuse public patients to have more time for private practice.

Mr. H. WILLINK suggested that there was a difference between a State medical service and other forms of salaried State service. A medical service could not be a hierarchical service in which promotion was obtained from one grade to another. The real risk of a salaried service for general practitioners was that promotion could not properly be present.

Mr. BEVAN thought the Opposition had been misled by uninstructed propaganda and the result had been the regurgitation of abstract principles bearing no relation to the actual proposition before the committee. He had accepted the proposition that a full salaried service was not reasonable, and in existing conditions would not operate to the best advantage of the community. Therefore, most unusually for him, he had reached an ingenious compromise. But instead of recognising his almost unprecedented resiliency the Opposition accused him of contradicting himself. He had attempted to introduce into the system two desirable elements—security for the individual, and competition to sweeten and refresh the service. Through the diminishing capitation rate he sought to destroy the worst features of the panel system. Unlimited competition had not brought universal benefits. It was astonishing to find Opposition speakers fighting so ardently for a principle against which their predecessors fought so ardently in 1911. With the years the panel system had acquired a sort of nimbus, but in 1911 it had horns. But he agreed that the white-paper was not written on brass, and he had an open mind as to the desirability of declining the capita-

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tion rate, and he was prepared to look at the matter again in the light of discussions with the medical profession.

Doctors no more than members of any other profession could be permitted the sole right of determining how much they were to be paid. Remuneration would be discussed with the profession and that was why he wanted it to be done by regulation, which the House of Commons could challenge. He had heard of no representatives of the profession yet who wished either the method or the amount of remuneration to be stated in the statute. The amendment was negatived by 25 votes to 12.

Mr. LINSTEAD moved an amendment to make certain that the terms and conditions of service under which the practitioner would work should be published a reasonable time before the appointed day. Though unable to accept the amendment, Mr. BEVAN agreed that reasonable notice, long before the appointed day, should be given.

ASSISTANTS

Colonel M. STODDART-SCOTT moved an amendment to obtain from the Minister a statement as to the position of assistants under the Bill. Mr. BEVAN agreed that an assistantship was a most desirable way of introducing a doctor to general practice. But at the same time practitioners could not be given an unrestricted right to take as many assistants as they liked, because that would interfere with the proper distribution of doctors. There would be no restriction on the rights of practitioners to have assistants where the executive council agreed that the area was not over-doctored. Assistants would not be on the list, but they would be registered doctors. There must be some kind of limitation restricting the assistant from starting practice in the same area as his principal, and there had already been preliminary discussions on this point with the medical profession.

CERTIFICATES

Mr. BEVAN assured Colonel STODDART-SCOTT that doctors inside and outside the scheme would be able to issue certificates both for their State and private patients. It was for the Minister of National Insurance to decide the competence of a certificate, but Mr. Bevan saw no reason why a certificate given by a doctor inside the public service should rank superior to a certificate from a doctor outside. Clause 33 was ordered to stand part of the Bill.

DISTRIBUTION OF DOCTORS

On clause 34 Mr. WILLINK moved an amendment providing that the power of general practitioners to apply to the executive council to enter the health service should be available not only before the appointed date but at any time. Mr. Willink appealed to the Minister to reconsider his policy with regard to the controlled distribution of doctors and the serious addition to criminal law made under clause 35. The introduction of the 1911 and 1912 legislation immensely improved the distribution of general practitioners when a small section of the population was brought in as capitation-fee-paying patients. This scheme would enable 100% of the population to be safe patients from the financial point of view. All would be on the same footing, and it was certain that there would be great improvements in the automatic distribution of doctors. Therefore he pressed on the Minister to wait and see what the distribution of the general practitioners really was during a period say of three years after the service came into operation. Any doctor in the committee would admit that there would be first-class doctors who would shrink from the controls which had to be introduced into any service of this kind.

Mr. BEVAN held that acceptance of Mr. Willink's point of view involved the continuation of the sale and purchase of practices. It involved a doctor choosing his own successor and also involved the extraordinary principle that the person selected by the doctor should be employed by the State. Lay people were entitled to some protection, and they did not seem to be getting it. Mr. Willink had answered his own case when he said that one consequence of the establishment of the National Health Insurance Act was to bring about a better distribution of doctors, and that the same consequences would probably arise from this Bill. To the extent that the Bill automatically brought about redistribution of doctors State interference would be reduced. But even if it were not necessary for the proper distribution of the general-practitioner service to abolish the sale and purchase of practices, he would still do it, because it was an intrinsic evil. It was accepted by the medical profession that there was a bad distribution of medical services, and the proposed procedure involved only a negative control. The machinery which Mr. Willink decried would be invaluable to the young doctor, because instead of "fumbling around" to find someone who wanted an assistant he would receive information from a central pool as to what areas he could go to at once. In practice the local medical committee would make suggestions to the local executive council as to a particular doctor in regard to a vacancy. The executive might not accept the recommendation, but half the representation on the local executive would be professional. Therefore the view of the local doctors' committee would have great weight with the tribunal and they would therefore recommend to the Medical Practices Committee the persons to be appointed. In fact, the doctor would be selected by the local executive and not by the Medical Practices Committee. So they would get three things which they were anxious to keep: the doctors themselves would influence the appointment of new colleagues; the executive would make the appointment; and the central committee would confirm the appointment. This arrangement satisfied every principle of democratic practice and wholesome administration. In course of time, as the general-practitioner service was redistributed over the country, this machinery would work more and more smoothly and with less and less interference, and it might be that some of it would pass almost into desuetude. Any dispassionate examination of the devices in this Bill would convince anyone who wished to be convinced that they had now found the right sort of solution which would in practice work out harmoniously.

Mr. J. S. C. REID asked if anyone was entitled in an open area to set up a surgery in the public service. Mr. BEVAN replied no, whereupon Mr. REID declared there was more control to be brought in by regulation than there was in the Bill, which as it stood did not bar the movement of doctors except where there were too many in the area. Mr. BEVAN explained that an open area was one that had not enough doctors. But by how many had it not got enough? Suppose it needed only one, were five to be allowed to put up their plates and compete for patients? Surely it was more sensible that the doctors in the area through their collective machinery should suggest a doctor to the executive council. He hoped that individual selection by individual doctors would progressively disappear. Dr. TAYLOR hoped that under the Bill every vacancy would be advertised. Practices should not be inherited, but a son should have every facility to succeed his father if he merited it against his fellows. The amendment was rejected.

FILLING VACANCIES

On June 20 Mr. WILLINK moved a series of amendments proposing that the local medical committees should make their recommendations for appointments to the executive council, which is the employing body responsible for maintaining the general medical services, and that the decision of that council should be submitted to the Medical Practices Committee. Mr. BEVAN had an alternative amendment on the paper providing that "before selecting any persons the Medical Practices Committee shall consult the executive council concerned, and that council shall, if a local medical committee has been formed for the area . . . consult that committee before expressing their views on the persons to be selected." Mr. Bevan held that his amendment satisfied all practical necessities. The Medical Practices Committee would authorise an appointment in an under-doctored area, and the executive council would be authorised to make the appointment. But before the appointment was made the council would consult the local medical committee. To encourage the creation of group practices it would obviously be desirable that members of the local group should have a voice in deciding who their new colleague should be. The executive

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council would report back to the Medical Practices Committee, who, in the overwhelming majority of cases, would confirm the appointment. But in order that the committee might possess the authority to intervene where some improper action had taken place, they must make the appointment. Mr. WILLINK withdrew his amendment and Mr. Bevan's amendment was agreed to.

Mr. LINSTEAD moved amendments urging that in making appointments regard should be paid to the wish of members of a family to work together, and to the views of the other partners in a group where a vacancy occurred. Mr. BEVAN said that these were precisely the sort of grounds that the local medical committee would take into account when making its recommendation to the executive council, but he did not think that a special statutory value should be given to family relationships. Indeed it was often desirable that there should not be too much inbreeding and that there should be infiltration from outside, but he agreed that where there was a family tradition it should have its influence on the selection. Mr. LINSTEAD withdrew his amendment, and the clause as amended was ordered to stand part of the Bill.

PROHIBITION OF SALE OF PRACTICES

Mr. WILLINK moved an amendment to clause 35 safeguarding the right of a partner remaining outside the service to sell his share of the practice. He did not imagine that this clause was directed against private practices, but in English law goodwill was an asset of the partnership and not of the individual partners, and as he read the Bill it would prohibit the sale of goodwill by partners in a partnership, including people who had never engaged, and had no intention of engaging, in panel practice. He believed that this clause would involve the dissolution of hundreds of partnerships. Mr. BEVAN had never before heard this clause attacked because it was obscure, but because it was so comprehensive as to be terrorising, and when the committee came to discuss that later he hoped to convince members that most of the terror had been taken out of it, though the protection of the Exchequer remained. He was advised that this amendment was unnecessary. It was not intended that partnerships should be universally dissolved. Where a partner had not got a panel, Mr. Bevan was advised, nothing in the clause inhibited him from selling his practice. Mr. Bevan promised, however, to look into the matter again, and the amendment was withdrawn.

MAGISTRATE OR JURY

Mr. WILLINK moved an amendment providing that courts of summary jurisdiction should have no more power than to inflict a fine not exceeding £100, and Mr. BEVAN agreed that where higher penalties were involved there was good reason for cases being tried before a court with a jury, and he would undertake to move a suitable amendment in that sense at a later stage of the Bill. But he did not wish the penalties to be too light. These cases would only occur where doctors had entirely misrepresented to the Medical Practices Committee what they had done, or had neglected to protect themselves by getting a certificate from the Medical Practices Committee, or were persons obviously with felonious intent. He was disposed at present to say that all cases which did not merely involve a small fine should go before a jury. The amendment was withdrawn.

Mr. WILLINK moved an amendment to provide that proceedings should not in any event be brought more than two years after the date of the commission of the alleged offence. He said that there was a general principle of law that time never barred the King unless there was some statutory time-limit. Mr. BEVAN said that when he first saw this amendment he was inclined to accept it, but on reflection he thought he must resist it. The object was to prevent transactions taking place clandestinely, and it sometimes took considerable time for them to come to light. But he would point out again that if a doctor had taken the reasonable precaution, which his own professional organisation would advise and would assist him in taking, of obtaining a certificate from the Medical Practices Committee he would be all right. The amendment was withdrawn.

SALE OF DOCTORS' HOUSES

Mr. WILLINK moved to omit subsection 4 of the clause because it set up criteria which seemed to be unworkable, and covered cases which it was never intended to cover. For example, a house might be sold by the widow of a National Health Service practitioner to a dental surgeon—a medical practitioner. If the price paid was deemed by the court to be higher by reason of the fact that that house had been used by a medical practitioner of another kind there would be an offence. Or, if the house was sold to an ear, nose, and throat man, or to a man who was not going for the public service at all, as Mr. Willink read the subsection, there would be deemed to be a notional sale of the old practice. That could not possibly be intended. There was a danger of professional men being unfairly brought before the court and subjected to embarrassment and expense. It should be made clear to the Director of Public Prosecutions what was the law on which he had authority to lodge these prosecutions, and Mr. Willink submitted that the Minister must reconsider this matter.

Mr. BEVAN agreed that we should not pass bad laws on the assumption that we had a good Public Prosecutor. But we should not pass bad laws on the assumption that we had an insane Public Prosecutor. He had considered the clause carefully because he recognised that it did create a number of criminal offences, and he did not want to worry or torment innocent people. At the same time, the Exchequer would pay out in the course of years a large sum of money in compensation to doctors for the loss of goodwill; indeed £66 million was a far more generous sum than the medical profession ever expected to obtain, but the Government were anxious that individual doctors should not suffer any loss from the action taken by the State. The State had permitted a pernicious practice to grow up, but the doctors were as much victims of that practice as they were beneficiaries from it. There was a temptation to a doctor wanting to go into a particular area to give a pecuniary advantage, or to go in without the advice of the executive council as to whom should be given a new practice; and that was what the Government wished to protect themselves against. He was advised that it would be perfectly proper to give more for a doctor's house because of its different physical structure, and that the language of the subsection only prevented the seller from obtaining money for the goodwill attaching to the house. The amendment was negatived.

PRINCIPALS AND ASSISTANTS

When the committee met on June 25, Mr. REID moved an amendment to transfer the onus of proof from the accused person to the prosecution where the assistant was alleged to have performed services for less than their worth because of contemplated succession to a practice. Mr. BEVAN promised to re-examine the wording of the clause but pointed out that its aim was to protect the young assistant. Mr. WILLINK said that the proof of a negative, which was to be imposed on doctors under the terms of the clause, was a heavy onus. Those who took assistantships now and were subsequently appointed as principals by the Medical Practices Committee might be liable to prosecution. The amendment was withdrawn.

SALE OF GOODWILL

Mr. BEVAN moved that subsection 10 (that a prosecution for an offence under this section should be instituted only with the consent of the Attorney-General) should be omitted and replaced by:

(10) Any medical practitioner or the personal representative of any medical practitioner may apply to the Medical Practices Committee for their opinion as to whether a proposed transaction or series of transactions involves the sale of the goodwill or any part of the goodwill of a medical practice which it is unlawful to sell by virtue of this section, and the committee shall consider any such application and, if they are satisfied that the transaction or series of transactions does not involve the giving of valuable consideration in respect of the goodwill or any part of the goodwill of such a medical practice, they shall issue to the applicant a certificate to that effect, which shall be in the prescribed form and shall set out all material circumstances disclosed to the committee.

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(11) Where any person is charged with an offence under this section in respect of any transaction or series of transactions it shall be a defence to the charge to prove that the transaction or series of transactions was certified by the Medical Practices Committee under the last foregoing subsection, and any document purporting to be such a certificate shall be admissible in evidence and shall be deemed to be such a certificate unless the contrary is proved:

Provided that, if it appears to the court that the applicant for any such certificate failed to disclose to the committee all the material circumstances or made any misrepresentation with respect thereto, it may disregard the certificate and this subsection shall not apply thereto.

(12) A prosecution for an offence under this section shall only be instituted by or with the consent of the Director of Public Prosecutions, and the Medical Practices Committee shall, at the request of the said director, furnish him with a copy of any certificate issued by them under subsection (10) of this section and with copies of any documents produced to them in connection with the application for that certificate.

Mr. REID sought to amend this amendment by adding words that would impose on the Medical Practices Committee the duty of stating to the applicant where the application was refused the reasons for refusal; and if the committee did not issue a certificate or send a note of their reasons against it within 14 days of receipt of the application, a certificate should be deemed to have been issued. Mr. Reid suggested that the mechanism would operate only if the work was done quickly. The Medical Practices Committee could not undertake this work without getting into arrears; it had other duties, and some priority should be given to this particular task. Decisions of the committee would be decisions of officials, and only important decisions would be considered by the committee itself; there must be provision for a full statement of reasons where applications were refused. Mr. BEVAN replied that this was exactly the sort of work for which the committee was suited. Proper standards would emerge among the profession itself. He undertook to examine the possibility of stating to which part of a contract exception was taken, but could not accept the imposition of a time-limit. Mr. REID said that speed was only a matter of setting up the right machinery. What was the poor widow that wanted to sell her house to do? The committee must tell her the top selling price before it was auctioned; she might otherwise have committed an offence as soon as the hammer fell. Mr. Reid's amendment was withdrawn.

Mr. Reid moved the substitution of the words "any fact known by him to be material" for "all the material circumstances" in the proposed subsection 11. He suggested that with the wording suggested by Mr. Bevan, innocent withholding of information might be penalised. The Minister presumably wanted to catch only the deliberate offender; but, with these words, practitioners would have to consult lawyers or write lengthy statements. Mr. BEVAN replied that he had in mind the case where a certificate had been granted and it was afterwards found that material circumstances had been withheld; the only defence that would be required if Mr. Reid's wording were adopted would be: "I thought it was of no importance." Mr. WILLINK said that in the operation of the clause with Mr. Bevan's proposed amendment, the position would be analogous to that with some insurance policies which proved useless because of innocent withholding of material circumstances. Mr. Reid's further amendment was withdrawn. Mr. BEVAN agreed to reconsider the wording of his amendment, which was accepted; and the clause was then ordered to stand part of the Bill.

COMPENSATION FOR LOSS OF PRACTICES

Under clause 36, Mr. WILLINK moved an amendment for the payment of compensation as soon as possible after the appointed day or the day on which the practitioner had his name entered on the list of those willing to provide general medical services. The amount invested in a practice might, he suggested, be the bulk or the whole of the doctor's capital. Why should not payment be made at once? Deferred payment implied a restriction on a particular class. Men transferring from general to specialist practice would no longer be able to use the capital from the sale of their practices to tide them over the transitional period; and other contingencies might arise where the money would be needed. Sir HENRY MORRIS-JONES suggested that the arrangement was a poor bargain for both the State and doctors. Practitioners should accept the offer of £66 million, but the money should be paid now. Mr. BEVAN replied that repayment would be made at the time when doctors normally received it. Colonel STODDART-SCOTT said that the possibility of appreciation or depreciation in the value of money in future years had been neglected. The amendment was withdrawn. With some verbal changes, the clause was ordered to stand.

Under clause 37, which deals with compensation for practices of doctors dying or retiring before the appointed day, Mr. BEVAN said that he wanted an equitable arrangement. He would consider the case of those dying or retiring before the Bill was enacted, but this would not influence the total of £66 million which was to be paid in compensation. The clause was ordered to stand.

PHARMACEUTICAL SERVICES

Sir HENRY MORRIS-JONES sought an assurance that, under clause 39, doctors in rural areas could continue to dispense medicines for their patients, since otherwise hardship would be caused. Mr. BEVAN agreed that this would be permitted. Clauses 38 and 39 were ordered to stand.

DENTAL SERVICES

Under clause 40, Captain J. BAIRD moved an amendment to provide special remuneration for dentists in otherwise unremunerative areas. He had in mind some system such as that in the Highlands and Islands scheme. Mr. BEVAN agreed that some form of attraction would be needed in these areas, and the amendment was withdrawn.

Captain BAIRD moved a second amendment to restrict the call for estimates before dental treatment was undertaken. General treatment should, he suggested, be possible without preliminary estimate. Mr. BEVAN said that for substantial or expensive treatment an estimate would be needed, but not for emergency or minor measures. The amendment was withdrawn.

Mr. WILLINK called for the proper use of ancillaries to relieve the dentist's burden and to hasten the institution of a national dental service. Captain BAIRD said that dental hygienists could be employed usefully only for scaling; to take away the mechanical side of the dentist's work would be to make his job monotonous. Mr. BEVAN said he regarded the provision of a dental service as an urgent matter. He would consider any supplementary assistance which would spread the dentists over the country. The clause was ordered to stand, and the committee adjourned.

QUESTION TIME

Extra Food for the Old

Mr. V. F. YATES asked the Minister of Food whether he would consider the advisability of improving the diet of elderly people by allowing a larger allocation of milk and eggs.—Dr. E. SUMMERSKILL replied: Extra milk and eggs could only be given to elderly people at the expense of other sections of the community, and as our medical advisers do not consider a special concession of this kind necessary, the Minister would not feel justified in reducing anyone's allowance still further in order to provide more for elderly people.

Mr. YATES: Will the Minister bear in mind that there is increasing difficulty on the part of the older people, especially old-age pensioners, by virtue of the limitations imposed upon them of standing in queues, where they are at a great disadvantage, and could they not be compensated in some such way as I have suggested?—Dr. SUMMERSKILL: There are 5 million old people over 65 years of age and we could not add them to the priority classes. Furthermore, old age is not pathological and digestive disturbances do not necessarily accompany it.

Surgical Boots and Belts

Mr. S. MARSHALL asked the President of the Board of Trade whether surgical belts and surgical boots, which were essentially health requirements, could now be supplied without coupons.—Mr. J. W. BELCHER replied: Surgical boots and

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most kinds of surgical belts must in fairness to all continue to be rationed because they can be worn in place of ordinary footwear and corsets, but the department are prepared to consider applications for special allowances of coupons for those who have to wear surgical belts or boots for the first time.

Family Allowance Claims

Mrs. AYRTON GOULD asked the Minister of National Insurance how many claims to family allowances had been received so far; and how and when claimants might expect to hear the result of their applications.—Mr. G. S. LINDGREN replied: Nearly 1,900,000 claims have so far been received and notifications to successful applicants will begin to be sent out on July 10. The first pay day is Tuesday, Aug. 6. Notifications to unsuccessful applicants will begin to be sent out about the same time, and except when it seems clear that the claim was made under a misapprehension, each applicant will receive a franked postcard for use if she wishes to appeal against the disallowance to one of the independent referees.—Mrs. GOULD: What proportion of the number of claims expected have been received and what was the percentage which had been wrongly filled in?—Mr. LINDGREN: The total which could have been received is 2,500,000. Of the claims so far received only 2% have had to be rejected.

Mr. J. D. MURRAY: Could the Minister say what form the rejection of the 2% takes?—Mr. LINDGREN: They are largely rejections arising where people who have one child of 18 and another of 12 think that, because they have two children, they can claim for two.

Advertised Cure for Skin Diseases

Mr. W. NALLY asked the Minister of Health whether he was aware that a preparation, particulars of which had been supplied to him, was now being advertised in the London area, claiming that it healed skin troubles within a few days and that it was prescribed by skin specialists; and, in view of the importance of these claims, if he would have this preparation examined and make known the results.—Mr. A. BEVAN replied: I do not know the merits of this preparation at all. But as I have no effective powers of intervention in these cases, I do not think I should be justified in adopting the suggestion.—Mr. NALLY: Is the Minister aware that this preparation, the advertising of which has cost the firm concerned some hundreds of pounds in the last fortnight on London Passenger Transport Board vehicles, makes the most specific claim to cure all manner of skin diseases in a few days? Has the Minister no power to interfere in a racket of this kind in which money is taken by false pretences out of people's pockets?—Mr. BEVAN: I regret to say that I have no power. I know that in many instances the public are grossly deceived by exaggeration.

Tuberculin-tested Milk

Major E. A. H. LEGGE-BOURKE asked the Minister of Food what procedure should be adopted by producer-retailers applying to sell tuberculin-tested milk to obtain registered customers who formerly were unable to obtain certified tuberculin-tested milk.—Dr. SUMMERSKILL replied: Producer-retailers seeking new registered customers who desire to be supplied should make known to the local food office and the regional milk-supply officer the fact that they have supplies of T.T. milk available. The local food office are empowered to transfer the registrations of customers desiring to be supplied with T.T. milk when their existing supplier is unable to supply them although this milk has been made available to him.

Major LEGGE-BOURKE: Is the hon. lady aware that considerable difficulty has been experienced by retailers in the past in obtaining anybody as a registered customer because of the meticulous details which have to be given in order to justify the purchase of T.T. milk at all?

Dr. SUMMERSKILL: I am not aware that there has been great difficulty, but if the hon. gentleman has any case in mind I shall be delighted to look into it, because I am particularly interested in this subject.

Royal Masonic Hospital

Mr. H. LINSTEAD asked the Minister of Health whether he had yet provisionally decided to exempt the Royal Masonic Hospital from transfer to the Minister under clause 6 of the National Health Service Bill.—Mr. BEVAN replied: No, it would be premature for me to make any such decision while the Bill is still before Parliament.

On Active Service

CASUALTIES

KILLED IN AIR ACCIDENT

Captain REGINALD THOMAS MOORE, M.R.C.S., R.A.M.C.

Captain E. STIRLING, M.B., R.A.M.C.

Both these officers were among the Army passengers who lost their lives when a R.A.F. Dakota crashed in Nigeria on June 9, during a flight between Kano and Ikeja. Dr. MOORE, who was 32, became assistant medical officer at Southmead Hospital, Bristol, after qualifying at Bristol University in 1939. Later he was appointed medical officer in charge of Snowdon Road Hospital, Bristol, a post which he held until he joined the R.A.M.C. in 1941. He took part in the North African campaign, and later served in West Africa. Dr. Moore was specialising in anæsthetics, and was clinical anæsthetist at Bristol Royal Infirmary and at the Burden Neurological Institute, Bristol. He leaves a widow and two children.

AWARDS

C.B.

Major-General W. E. TYNDALL, C.B.E., M.C., M.B. Dubl., late R.A.M.C.

C.B.E.

Brigadier MONAWAR KHAN AFRIDI, O.B.E., M.D. St. And., I.M.S.
Brigadier J. C. HAWKSLEY, M.D. Lond., F.R.C.P., R.A.M.C.
Brigadier G. E. MACALEVEY, D.S.O., M.C., M.R.C.S., R.A.M.C.
Brigadier H. L. MARRIOTT, M.D. Lond., F.R.C.P., R.A.M.C.
Brigadier M. F. NICHOLLS, M.CHIR. Camb., F.R.C.S., R.A.M.C.
Colonel J. J. O'DWYER, M.B. Dubl., R.A.M.C.
Brigadier ALFRED SWINDALE, O.B.E., M.D. Durh., R.A.M.C.
Colonel JULIAN TAYLOR, O.B.E., M.S. Lond., F.R.C.S., R.A.M.C.

O.B.E.

Lieut.-Colonel SAILENDRA MOHAN BASU, M.B. Rangoon, M.R.C.P., I.M.S.
Lieut.-Colonel D. C. BOWIE, M.B. Glasg., F.R.C.S.E., R.A.M.C.
Lieut.-Colonel J. C. COLLINS, M.R.C.S., R.A.M.C.
Colonel A. L. CRADDOCK, M.B.E., M.B. Lond., Army in Burma Reserve of Officers.
Colonel R. D. DAVY, M.C., M.B. Lond., R.A.M.C.
Lieut.-Colonel D. J. LAWLESS, M.B. N.U.I., R.A.M.C.
Lieut.-Colonel L. R. S. MACFARLANE, M.B. Dubl., R.A.M.C.
Lieut.-Colonel C. W. MAISEY, M.R.C.S., R.A.M.C.
Lieut.-Colonel W. C. MITCHELL, M.B. Aberd., R.A.M.C.
Lieut.-Colonel C. E. MOORHEAD, M.B. Birm., R.A.M.C.
Major F. P. H. E. ORBAN, M.D. Liége, R.A.M.C.
Lieut.-Colonel H. G. PAGE, M.B.E., M.B. Edin., F.R.C.S.E., R.A.M.C.
Lieut.-Colonel A. S. RAO, M.B., I.M.S.
Lieut.-Colonel WILLIAM SERLE, M.B. Edin., R.A.M.C.
Colonel C. O. SHACKLETON, M.B. Durh., R.A.M.C.
Lieut.-Colonel F. W. SNEDDEN, L.M. Newfd, I.M.S.
Lieut.-Colonel B. P. SRIVASTAVA, M.B. Bombay, I.M.S.
Lieut.-Colonel W. G. SUTCLIFFE, M.R.C.S., R.A.M.C.

M.C.

Captain D. R. EVANS, M.B. Edin., R.A.M.C.
Major JULIUS JACOBS, M.B. Glasg., R.A.M.C.
Captain G. H. PIMBLETT, M.B. Lpool, R.A.M.C.

MENTIONED IN DESPATCHES

R.N.

Surgeon Lieut.-Commander E. B. BRADBURY.
Surgeon Commander D. F. WALSH.

R.N.V.R.

Surgeon Lieut. I. S. BERGIUS.
Surgeon Commander R. D. BRADSHAW.
Surgeon Lieut.-Commander W. P. G. DICKSON.
Surgeon Lieut. R. R. H. LOVELL.
Surgeon Lieut. R. D. MACLEAN.
Surgeon Lieut.-Commander JAMES WATT.
Surgeon Lieut. B. J. WEBB.

R.A.M.C.

Major D. D. A. FRASER.
Major J. D. FRASER.
Captain D. R. MACAULEY.

R.C.A.M.C.

Captain B. BERNSTEIN.

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Obituary

HAYWARD CARPENTER

M.B. LOND., D.P.H.

Dr. Hayward Carpenter died after a short illness on May 7, in the Isle of Wight, at the age of 54. Born in North London, the son of a solicitor, he was educated at St. John's College, Highbury, and Charing Cross and University College hospitals. In 1918 he graduated M.B. and five years later he obtained his D.P.H. Meanwhile, after working at the City of London Hospital for Diseases of the Chest, and in Leicestershire as assistant tuberculosis officer, he had become clinical tuberculosis officer to the Isle of Wight county council and M.O.H. to the borough of Ryde and the urban districts of Sandown-Shanklin and Ventnor, appointments he held until his death. A great worker, he was intimately acquainted with all the health problems in his districts and enjoyed the confidence of his committees and the public. His duties were heavily increased during the war in connexion with A.R.P. casualty services and he had never fully recovered from the strain of this work.

Kindly, modest, and cheerful, he enjoyed a full life, enriched by his interest in country lore and music. He leaves a widow and two sons, the elder serving with the Warwickshire Regiment in Egypt, the younger a medical student at Oxford.

HERBERT GASTINEAU EARLE

M.A., M.B. CAMB., LL.D. HONG-KONG

IN the spring of 1941 Dr. Earle left his wife and family in England to return to Shanghai to his post as director of the Henry Lester Institute of Medical Research and to face the difficulties and dangers which he must have known were about to come to a head in the Far East. His action was in keeping with the high sense of duty and the care which he gave to the institute he had nursed from its birth. When war broke out the institute was occupied by the Japanese, and Earle with other members of the staff was interned for four years in the Lunghwa camp, where "with splendid self-forgetfulness," writes H. G. T., "he cared for the welfare of his fellow internees." In the same spirit, after his release from internment at the end of the war, he stayed on, though he had ceased to be director, to do what he could to get the institute on its feet again. During internment he must have suffered in mind at the stupidity and waste of war, for he loved peace and lived for the improvement of the lot of mankind. On the eve of Victory Day news came that on his way home he had died at sea, on June 5, after a short illness.

Dr. Earle had been adviser to the Henry Lester Trust since 1926. The institute staff began to assemble in 1927 and grew in size and achievement till the outbreak of the Sino-Japanese war in 1937, when its activities had to be curtailed. Nevertheless, the annual reports from 1934 to 1940 are records of additions to knowledge over a wide field of medical research. His policy as director was "to stress the view that disease is a general biological problem and that all medical research should have a fundamental philosophical background if it is to be intelligently pursued." He liked the definition of the field of work of the Medical Research Council: "Medical research deals with the proper development and use of the human body in all conditions of activity and environment, as well as with its protection from disease and accident and its repair," and he pointed out in the report of the institute for 1934 that the applied part of medical research comes at the end of this definition. That he realised this aim is shown in a letter from a Chinese member of the staff quoted in the last published report (1940): "This institute is one of the very few, if not the only one in this country at present, where students of science may view their work in a more or less abstract manner and need not concern themselves with the question—'What is the use?'"

Earle was born at Acton in 1882 and educated at the City of London School. In 1902 he went to Downing College, Cambridge, with a foundation scholarship, and three years later obtained a first-class in the natural sciences tripos. In 1904 he became demonstrator of physiology at the Middlesex Hospital. In 1913 he qualified in medicine at Westminster Hospital, and two years later he left the Middlesex to take up the chair of physiology at Hong-Kong. In 1916 he became dean of the faculty of medicine and in 1936, in recognition of his services, the University of Hong-Kong conferred on him the honorary degree of LL.D. His own interest in research was in basal metabolism, on which he published papers in the *Lancet* in 1921 and the *Chinese Journal of Physiology* in 1928, and after the organisation of the institute was completed he took up his investigations once more. From 1926 to 1934 he was chairman of the research council of the Chinese Medical Association, and his obvious sympathy with the aspirations of the Chinese stimulated real contributions to scientific knowledge. The loss of his wisdom and experience will be widely felt in the East, especially in the difficult period of rehabilitation ahead.

He leaves his widow with a son and three daughters.

VICTOR GEORGE LEOPOLD FIELDEN

M.D. BELF., M.B.R.U.I.

Dr. Victor Fielden, who died on June 5 in Belfast in his 79th year, retired from the staff of the Royal Victoria Hospital in 1932 after long service as senior anæsthetist. As senior member of the consulting staff he was present at the annual dinner last October but since then his health had failed.

Born at Plymouth, Fielden went to Belfast as a boy of 15, and he graduated at the Royal University of Ireland in 1892, taking the M.D. with gold medal in 1912. In his earlier years he helped the late Sir William Whitla in the preparation of successive editions of his *Materia Medica* and *Dictionary of Treatment*, and the two men were for a long time associated in the university after Fielden was appointed lecturer on practical pharmacy and dental materia medica. His interest and special knowledge of anæsthetics quickly won him a reputation, and besides his appointment at the R.V.H. he was also consulting anæsthetist to the Ulster Hospital for Women and Children. Generation after generation of medical students were taught by him, and "old Queensmen the world over," writes R. S. A., "will always remember Victor Fielden's ways—his tall commanding presence, his striding gait, and the jutting beard. Sometimes he may have been rather brusque in his way with them, for leg-pulling at lectures was prevalent in those days, but underneath the frowning exterior, everyone knew that 'Victor' had a kind heart and bore no malice."

For more than 20 years Dr. Fielden was the energetic treasurer of the Medical Benevolent Fund, and though he did not take a great part in public life he was active on behalf of a number of charities, especially in missions to seamen. But outside his family and profession his chief interest lay in the Church of Ireland, and his experience in church affairs was recognised when he was appointed lay representative on the diocesan synod. Allied to this was his unusual hobby of campanology. He joined the Honorary Society of Bellringers of St. Thomas's Church in 1881 and performed the duties of conductor from 1904 to 1908. He took part in the special rings commemorating the jubilee of Queen Victoria in 1887, and the death of King Edward VII in 1910, and as a mark of respect and mourning the members of the society rang a short touch of 360 changes of Plain Bob Minor with the bells muffled on the Sunday following his death.

Dr. Fielden's wife died in 1937, but he is survived by a son and four daughters.

PROF. ERNST FREUND.—A correspondent points out that in the first paragraph of our obituary notice last week there was some confusion between Professor Freund the biochemist and Dr. E. Freund the physiotherapist who happily is still alive. Professor Freund was born and educated in Vienna and had never practised. He was a pupil of E. Ludwig, and was appointed "Vorstand des chemischen Laboratoriums der k.k. Krankenanstalt Rudolfstiftung" in the 1890's; he held this position until he reached the retiring age about 15 years ago.

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Notes and News

UNRRA NURSES IN EUROPE

THE work of UNRRA for displaced persons naturally includes nursing care for those who need it. At a press conference on June 13 some of the nurses who have been working at the European assembly centres told their experiences. Many displaced persons, of course, have already gone home and the rest are being steadily repatriated, but large numbers still need care, and the nurses, besides looking after them in the camps, have taught them something about nutrition and have trained nursing aids from among them. All told similar tales.

Miss Lyle Creelman, of Canada, UNRRA's chief nurse to the British zone of Germany, spoke of active maternity and child-welfare and nutrition clinics. Most displaced persons have been immunised against typhus and typhoid, and the much-feared epidemics never appeared. The birth-rate is high among them, but the infant death-rate was kept below that in the countries from which the mothers came—a good record, considering the food situation in Europe just now.

Major Therese Kerze, of the United States, nursing consultant to the UNRRA mission to Jugoslavia, described the great lack of trained nurses in that country: about 6000 are needed, and about 400 available. These Jugoslavian nurses, however, have had a three-year training, and the training schools of the country will turn out about 80 a year from now on. The UNRRA nurses have been able to give advice on methods of teaching, to work out lesson plans, and to offer refresher courses to the trained nurses. Jugoslavia has the makings of a good public-health nursing service if the nurses can be trained fast enough to do the work.

Miss Grant Glass, of Edinburgh, who had served as chief nurse of the UNRRA mission to Austria, described widely spaced camps and transport difficulties. In spite of these and other handicaps health among displaced persons has remained remarkably good, and so has their food-supply until recently, when they were reduced to the same rations as the rest of Austria; even so, it has been possible to supplement the diet from Red Cross parcels. The Austrian nurses are out of touch with recent teaching, and are anxious to return to a three-year training instead of the two-year training they have been offered during the war. Hospitals are acutely short of equipment, and in one the nurses have asked leave to go without shoes rather than go on working in the ones they had.

Miss Muriel Doherty, of Sydney, nursing consultant to the UNRRA mission to Poland, told of hospitals, equipment, and books destroyed by the Germans, and of nearly half the Polish nurses killed in the war. Poland had a high standard of nursing before the war; now their nurses are few and in poor health; food is scanty and upsetting, pay low, clothing scarce; yet there have been great advances, even in the last five months. The Polish nurses know what they want to do and they are enthusiastic. Five training schools are now in action, of which four have been reopened since the end of the war. The UNRRA nurses provided roneo copies of lecture notes to replace the missing books, and the nursing staffs of Swedish, American, and Australian hospitals have adopted Polish hospitals, sending uniforms, equipment, and other necessaries to their colleagues there.

Conditions in Italy were described by Captain Eleanor Gochanour. Some 33 nations were represented in the Italian camps, and it was possible to provide only one UNRRA nurse for each camp; these had to rely on Italian nurses for help, and on nursing aids trained from among the displaced persons. Civil trained nurses are not popular in Italy, where most of the nursing is done by nuns, and there are no funds to run training schools, which are therefore few.

UNRRA hopes to arrange for 20 nurses from each of the receiving countries to come to England or America for refresher courses, so they may carry back inspiration to their own people and renew the international links between nurses which had been forged before the war.

A JOURNAL FOR THE DEAF

". . . WE are going to tell the world that we are not the odd and dismal folk so many of our more fortunate fellow-mortals think we are," writes the Duke of Montrose in an opening message to the first number of *The Silent World*.[1] It is true that many with hearing avoid the deaf in a way that they would never think of avoiding the blind. This cheerful little journal explains in more than one place how this distrust arises—chiefly from shyness on both sides. In its pages the deaf are pleasantly exhorted to be frank about their disability, to bring out their hearing-aids boldly and without false shame—"Sorry, old man, I'm deaf as a post. Wait till I get the old juke-box. . . ." This is the right response to an unheard question, and helps the questioner to feel equally responsive and friendly.

Some articles in this first number are of general interest, while many deal with topics of special concern to the deaf. After August it will appear monthly.

1. Official organ of the National Institute for the Deaf, 105, Gower Street, London, W.C.1. 6*d*.

UNIVERSITIES AND TEACHING HOSPITALS

IN a letter to the *Times* of June 21 the vice-chancellors of Oxford and Cambridge universities appeal for greater university representation in the control of teaching hospitals than is proposed in the National Health Service Bill. Under the Bill the Minister has power, after consultation with the university concerned, to designate as a teaching hospital any hospital or group of hospitals providing facilities for undergraduate or postgraduate teaching; the board of governors of a teaching hospital may conduct research; and not more than a fifth of the board is to be nominated by the university with which the hospital is associated. The two vice-chancellors think these provisions unsatisfactory. In their view research is a primary function of universities, and the responsibility for conducting research should rest with the university rather than with the hospital governors: the board of governors should be responsible for providing, in consultation with the university, the facilities for research, as well as for teaching, but the university should be more strongly represented on the board. Finally, since it would be difficult, if not impossible, to organise a teaching hospital without university coöperation, the Minister, in designating a teaching hospital, should act "on the recommendation of" and not merely "in consultation with" the university concerned.

INHALER FOR PENICILLIN

THE 'Deedon Inhaler' (Moore Medicinal Products Ltd., Aberdeen, Scotland) is a neat hand inhaler, constructed entirely from plastics, intended for the administration of penicillin or antispasmodics. It gives a very fine mist, likely to penetrate as far as the small bronchi and bronchioles, and is well adapted for use with penicillin. The detachable plastic syphon is robust compared with similar glass syphons, and is relatively easy to clean. Rough trials showed that when 0·5 c.cm. of penicillin in 30% glycerin was placed in the reservoir and the rubber bulb was squeezed at each inspiration (as in inhalation) the time needed to use up the solution was 6–7 minutes. This is reasonably short, but the procedure is tiring to the hand, and there is a definite need for development of some other type of blowing device than a rubber bulb—a small pump or bellows, for example, which could be worked by the weight of the arm rather than by squeezing. The makers advertise an electric pump at £20, which is expensive, or advise attachment to a cylinder of compressed oxygen, which also becomes expensive if used for long periods. The inhaler itself costs 18*s*.–26*s*., according to the model.

A TUBERCULOSIS DIGEST

THE *Tuberculosis Index*[1] adds one more to the growing number of abstract journals for which there is undoubtedly a need, especially in such proliferative specialties as this. The method adopted here has been to list the recent publications under divisions—epidemiology, pathology, and so on—and to allot each division to a reviewer. Some papers are selected for survey, with or without critical comment, while with others only the reference or a one-line summary is given. The function of such a journal is to guide readers to papers which might otherwise be missed or overlooked for some time. Ideally, a summary should be given for each paper. If this is impracticable, the trouble taken in obtaining the more obscure journals and, where necessary, in having them translated, might be justified, without further words, by using the system of starring applied by some film critics: three stars for a "must"; two stars for sound work; and one star to denote a readable paper for those who are interested. This practice would be particularly apt in this case, where the subject is divided into watertight compartments.

1. *Tuberculosis Index and Digest of Current Literature*, March, 1946. Published quarterly by the National Association for the Prevention of Tuberculosis, London. Annual subscription 15*s*.

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By compiling this quarterly the Tuberculosis Education Institute will ease the lot of those who have hitherto tried to wade through the flood of world writings on tuberculosis to keep abreast of the times.

JOURNAL OF GERONTOLOGY

THE appearance of a new medical journal is apt to dishearten the conscientious doctor who feels he must "keep up with the literature." But new foci of interest demand, and justify, journals which will collect in a new grouping contributions hitherto widely dispersed. A welcome instance of this is the *Journal of Gerontology*, the first number of which has just been published in the United States.[1] It recognises the now widespread interest in ageing, and covers much besides the medical aspect. So wide is the net thrown that an article is included on the involution of tissues in fœtal life (progeria with a vengeance); there are anthropological, socio-economic, literary, and botanical contributions, as well as studies of mortality in the higher age-groups, the relationship of ageing to nutritional deficiency, and the effects of thymectomy. A separate "non-technical supplement" gives the substance of the main articles, in simpler language and larger print. The editor incidentally explains in a reasoned note his decision to use the spelling "aging"; those who accept the authority of the *Rules for Compositors and Readers at the University Press, Oxford*, will prefer the retained *e*, but the American practice has the merit of brevity.

POLICE EXHIBITION

THE exhibition held at the Royal Pavilion, Brighton, from June 4 to 22 marked another stage in this era of increasingly friendly relations between police and public. By taking the public behind the scenes to see a cross-section of the vast organisation which has been built up since the days of the Watch and the Bow Street Patrols, the exhibition gave the large number of people who attended a comfortable feeling of confidence in police administration and scientific criminal detection. For example, one had only to compare the peeler's rattle with the present-day telecommunication apparatus to see how far crime control has had to advance to keep a step ahead of the criminal. The exhibits should certainly find a permanent setting.

TWO HEARING-AIDS

Messrs. Allen & Hanburys have produced a valve-amplifying hearing-aid which is listed as the 'Bonochord P4.' It is light and portable in a neat leather case and is fitted with a head-phone receiver as well as a meatal receiver. The former gives good reception, but is a little brassy and metallic at nearly full volume. The latter was not working on the model tested but the makers claim it is both faithful and efficient. The low-tension battery is a standard one and can be bought anywhere, but the high-tension battery is more difficult to get, although it is apparently soon to be produced in quantity. The aid costs 22 guineas.

Messrs. John Bell & Croyden are selling an aid known as the 'Belclere M.A.3,' which is a valve amplifier worked off the mains and can be plugged into any socket receiving alternating current at 200–250 volts. It has considerable powers of amplification but is metallic at the upper limits. There was also a mains hum in the model tested, but this was not perceived by the deafer patients. The only receiver supplied was a head-phone. A crystal microphone is used. The instrument is rather large but not heavy, and is readily portable. It costs 28 guineas.

University of Oxford

On July 1 the honorary degree of D.SC. will be conferred on Prof. J. B. Collip, F.R.S., head of the research institute of endocrinology at McGill University, Canada.

On June 15 the degree of D.M. was conferred on R. D. Newton and the degree of B.M. on T. J. Thompson.

Diploma in Tropical Medicine and Hygiene

The following were successful in the recent examination of the Conjoint Board for the D.T.M. and H.:

A. Barnet, G. V. Blaine, J. A. Campbell, A. H. R. Coombes, A. R. Darlow, J. De Zulueta, K. V. Earle, E. Fletcher, D. W. Gould, Y. G. Gupte, H. Y. Hain, T. H. Harrison, W. Hartston, S. W. Hinds, P. J. Jhaveri, J. W. L. Kemp, W. E. Kershaw, P. M. Luhar, A. McGregor, D. H. Mackay, M. S. Moitra, A. H. Mousa, A. K. Ng-Chhung-Hin, P. Pau, H. A. A. Ragab, M. T. Read, A. F. Russell, P. W. J. Searle, B. A. Stoll (awarded Duncan medal), and A. F. Stookes.

1. Obtainable from Ballière, Tindall and Cox Ltd. Annual subscription £1 16s.

Society of Medical Officers of Health

The county-borough group is holding its annual meeting and weekend conference from July 19 to 22 at Eastbourne, under the presidency of Dr. R. H. H. Jolly. Subjects to be raised include the care of homeless children (Dr. J. Fenton), the Peckham health centre (Dr. G. Scott Williamson), the new National Health Service (Dr. J. F. Galloway), and medical administration as a career (Prof. J. M. Mackintosh). The hon. secretary of the group is Dr. J. Greenwood Wilson, City Hall, Cardiff.

Indian Medical Service

The I.M.S. dinner was held in London, after a lapse of seven years, on June 19, when 83 serving and retired officers attended. Lieut.-General Sir Ernest Bradfield, who presided, said that in September, 1939, the strength of the I.M.S. was 631 officers, of whom 265 were in civil employment. At the end of the war with Japan the service, including the new Indian Army Medical Corps, had 7625 officers, of whom 108, and 31 re-employed retired officers, were in civil employ. Included in these figures were 206 women doctors, of whom 53 had been recruited in the United Kingdom. Recruitment to the Indian forces remained on a voluntary basis throughout the war, and 23% of Indian graduates under 45 years of age and 12% of the medical licentiates of the same age were recruited to the Armed Forces. From May, 1942, recruitment of Europeans to the I.M.S. ceased and the War Office undertook to provide from the R.A.M.C. British doctors required for duty with Indian troops. A mission sent to India in that year, with Mr. H. S. Souttar as its leader, saw that the real danger of the situation lay in the quality of the recruits provided for the Indian Hospital Corps, and the scarcity of trained nurses; a system under which the officers belonged to the I.M.S., the Viceroy's commissioned officers and warrant officers to the I.M.D., and the men to the Indian Hospital Corps was now obviously unworkable. The mission therefore made proposals designed to provide one efficient and complete medical corps for all ranks of the Indian Army, and as a result came the I.A.M.C. Of the I.M.S. officers remaining on the civil side it might be said that rarely have so few doctors had to bear so many responsibilities. No-one, General Bradfield concluded, can yet foretell the future of the Indian Medical Service: it is only logical that the disposal of all the Indian services should be decided when a political settlement is reached. But "the creation of an Indian medical profession based on the ideals of British medicine has always been the aim of our service, which founded the first medical colleges in India more than 150 years ago. The record and place of the I.M.S. in the building up of modern India is second to none of the great administrative services, and the I.M.S. will live in the I.A.M.C., in more than 45,000 registered doctors, and in the Civil Medical Services of India, who owe their existence in a very large measure to our service."

Replying to the toast of The Guests, proposed by Major-General Sir John Megaw, Mr. Souttar said that India would not forget the work of the service, which will remain a great tradition.

Army Blood Transfusion Service

Presiding over the first reunion dinner of this service, held in London last Saturday, Sir Lionel Whitby read part of a letter from the Director-General of Army Medical Services speaking of "the grand team which did so much for the Army during the war." The team, said Sir Lionel, though controlled and directed by the R.A.M.C., was the most motley crew ever thrown together—Q.A.I.M.N.S., V.A.D., R.E., R.A.S.C., "A.T.S. of every kind, officers on the General List, and Mr. McCrudden." Its members had gone to every theatre of war and he hoped it had done its job well. Brigadier J. S. K. Boyd, director of pathology, responding for the guests, said that the Regular nucleus of the R.A.M.C. owed a great debt to Sir Lionel Whitby and his motley crew, and so did every soldier who had been transfused. From the primitive days of transfusion in M.E.F., when he had the greatest difficulty in persuading the powers-that-be that his refrigerators were not needed for storing meat, and when he found in Colonel G. A. H. Buttle (with his "unmastered importunity") the one man capable of dealing with such a situation, Brigadier Boyd went on to describe the transfusion arrangements for the invasion of France, when 8 transfusion units were transported complete with their bottles of fresh blood. The A.B.T.S., he felt, had set a high standard of service, and it had made history.

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Cardiff Health Exhibition

The Health and Housing Exhibition held last week at Cardiff was opened on June 17 by Alderman C. W. Key, parliamentary secretary to the Ministry of Health. The first of five evening lectures was given by Dr. Charles Hill, whose 50-minute talk on Good Health was relayed from an overflowing lecture theatre to the crowd which waited outside to hear it, despite intermittent drizzle. Sections of the exhibition illustrated health in the home, in the school, through work, through recreation, through nutrition, "through yourself," through housing, through the community, through the port, and through knowledge. "Health careers" were described, and there were displays of boxing and other recreational activities. The lecturers included Dr. Norman Tattersall, Dr. A. McLachlan, Dr. Greenwood Wilson, Dr. W. Powell Phillips, Dr. A. G. Watkins, Prof. G. I. Strachan, Prof. R. M. F. Picken, and Dr. D. G. Morgan.

Medical Insurance Agency

At the annual meeting on June 14, with Sir Robert Hutchison in the chair, Sir Henry Tidy, Mr. A. M. A. Moore, and Mr. Ronald Raven were elected to the committee; Lord Horder, Dr. Alfred Cox, Dr. J. A. Brown, Dr. James Fenton, and Dr. R. W. Craig were re-elected. The committee accepted with regret the decision of Sir Hugh Lett and Dr. L. G. Glover not to seek re-election. Allocations to the Royal Medical Benevolent Fund and to the Royal Medical Foundation of Epsom College totalling about £5600 were approved from the disposable surplus on last year's working.

Pathological Society of Great Britain and Ireland

A meeting of the society will be held at the University of Aberdeen on Friday and Saturday, July 5 and 6.

Appointments

BARRETT, N. R., M.CHIR. Camb., F.R.C.S.: asst. surgeon, Brompton Hospital, London.
BROWN, A. ROWATT, M.B. Glasg.: physiotherapist, Hampstead General Hospital.
COLMAN, H. M., M.D. Goettingen and Florence: asst. physician, Hospital for Diseases of the Skin, London.
CUTHBERT, J. C., M.B. Glasg., M.R.C.O.G.: medical superintendent, Dorking County Hospital.
ENGLAND, CLEM, M.B. Sheff.: factory surgeon, Castleton, Derbyshire.
HUGHES, EDWARD, M.D. Lpool: M.O.H., M.O. to the Port Health Authority, and superintendent schools M.O., Preston.
KERSLEY, G. D., M.D. Camb., F.R.C.P.: visiting physician, British Red Cross Clinic for Rheumatism, London.
MITCHELL-HEGGS, G. B., O.B.E., M.D. Lond., F.R.C.P., consulting dermatologist, Charterhouse Rheumatism Clinic, London.
PAGE, E. D., M.B. Lond.: asst. physician, Hospital for Diseases of the Skin, London.
PATTERSON, J. W. T., M.D. Edin., F.R.C.P.E.: visiting physician, British Red Cross Clinic for Rheumatism, London.
RIGBY, J. P. V., B.M. Oxfd: asst. tuberculosis officer, Lewisham Tuberculosis Dispensary.
TUBBS, O. S., M.B. Camb., F.R.C.S.: asst. surgeon, Brompton Hospital, London.
TURNER, F. L., M.B. Edin., D.A.: visiting anæsthetist, Leicester Royal Infirmary.
WADDINGTON, G. H., M.R.C.S.: radiological registrar, Sunderland Royal Infirmary and Children's Hospital.
WALKER, J. S., M.D. Aberd.: regional school M.O. for the counties of Aberdeen and Kincardine.

The Royal Cancer Hospital (Free), London.—The following appointments are announced:—
GOLDING, F. C., M.B. Sydney, M.R.C.P., D.M.R.E.: director, X-ray diagnostic dept.
LEDERMAN, MANUEL, M.B. Lond., D.M.R.E.: asst. director, radiotherapy dept.
PRICE, L. W., M.D. Camb.: director, pathological dept.

Westminster Hospital.—The following appointments are announced:—
ASHCROFT, D. W., M.B. N.Z., F.R.C.S., D.L.O.: asst. surgeon, ear, nose, and throat dept.
D'ABREU, F. A., CH.M. Birm., F.R.C.S.: asst. surgeon.
GAVEY, C. J., M.D. Lond.: asst. physician.

Guy's Hospital.—The following appointments are announced:—
BATCHELOR, J. S., F.R.C.S.: orthopædic surgeon.
BISHOP, P. M. F., D.M. Oxfd: endocrinologist.
HARDWICK, C., M.D. Camb., M.R.C.P.: asst. physician.
MANN, W. N., M.D. Lond., M.R.C.P.: asst. physician.
READING, P. V., M.S. Lond., F.R.C.S.: ear, nose, and throat surgeon.
WASS, S. H., M.S. Lond., F.R.C.S.: asst. surgeon.

Birmingham Children's Hospital.—The following appointments are announced:—
MOFFETT, A. J., M.B. Birm., F.R.C.S.: asst. aural surgeon and laryngologist.
PARSONS, C. G., M.D. Camb., F.R.C.P.: physician to outpatients.
WELSH, FAUSET, M.B. Birm., F.R.C.S.: surgeon to outpatients.

Royal Liverpool United Hospital.—The following appointments are announced:—
BROOKFIELD, R. W., M.D. Lpool, F.R.C.P.: physician, Royal Southern Hospital branch.
CHAMBERLAIN, E. N., M.D. Lpool, F.R.C.P.: physician, Royal Southern Hospital branch.
ELLIS, G. R., M.D. Camb., M.R.C.P.: physician, Liverpool Stanley Hospital branch.

Medical Diary

JUNE 30–JULY 6

Tuesday, 2nd

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
1.30 P.M. Annual meeting.
5 P.M. *Pathology.* Prof. H. R. Dean: The Pathological Society of London. Prof. G. R. Cameron, Sir Paul Fildes, Prof. E. C. Dodds, and Prof. James McIntosh: The Century's Progress.
LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. I. Muende: Fungus Infections of the Skin.

Wednesday, 3rd

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. (7, Drumsheugh Gardens.) Dr. J. A. P. Cameron: Surgery in a Japanese Prison Camp on Singapore Island.

Thursday, 4th

LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. H. MacCormac: Malignant Growths of the Skin.
EDINBURGH POSTGRADUATE LECTURES
4.30 P.M. (Royal Infirmary.) Mr. B. Soutar Simpson: Tuberculosis in Sutherland. (Honyman Gillespie lecture.)

Births, Marriages, and Deaths

BIRTHS

BADENOCH.—On June 10, in London, the wife of Mr. A. W. Badenoch, F.R.C.S.—a son.
BAKER.—On June 10, at Southend, the wife of Dr. D. M. Baker—a son.
BAUER.—On June 14, at Huddersfield, the wife of Dr. F. Bauer—a son.
BIRT.—On June 11, at Cubert, Newquay, the wife of Lieut.-Colonel A. B. Birt, R.A.M.C.—a daughter.
BOLTON.—On June 12, in London, the wife of Dr. J. R. Bolton—a son.
BRIGGS.—On June 18, at Nottingham, the wife of Dr. A. J. Briggs—a daughter.
CAVE.—On June 17, in London, the wife of Dr. J. N. Cave—a son.
CRAIG.—On June 16, in Malta, the wife of Mr. A. J. Craig, F.R.C.S.—a daughter.
DANCER.—On June 5, at Salisbury, the wife of Captain J. B. Dancer, R.A.M.C.—a son.
DICKIE.—On June 19, the wife of Dr. David Dickie, of Marton-in-Cleveland, Yorks—a son.
EDMUNDS.—On June 10, at Cardiff, the wife of Dr. P. K. D. Edmunds—a daughter.
KERR.—On June 15, the wife of Surgeon Lieutenant David Kerr, R.N.V.R.—a daughter.
KILLPACK.—On June 17, at Haywards Heath, Sussex, the wife of Dr. G. M. Killpack, M.C.—a daughter.
LAWRIE.—On June 17, in London, to Dr. Jean Laurie (née Grant), wife of Major Rex Lawrie, F.R.C.S., R.A.M.C.—a son.
MACFARLANE.—On June 14, at Reading, the wife of Dr. H. P. E. MacFarlane—a son.
MORE.—On June 18, the wife of Dr. Ian More, of Lacock, Wilts—a son.
ROBERTS.—On June 20, in London, the wife of Dr. F. W. Roberts—a son.
WELLS-COLE.—On June 15, the wife of Dr. G. H. Wells-Cole, of Lincoln—a son.
WIGRAM.—On June 11, at Oxford, the wife of Dr. Michael Wigram—a daughter.
WILLATT.—On June 8, at Bognor Regis, the wife of Dr. I. D. Willatt—a daughter.

MARRIAGES

GARLAND—SALTER.—On June 15, in London, Herbert Joseph Garland, L.M.S., of Gt. Bardfield, to Catharine Ellen Salter, of Clavering.
NUTMAN—WOODS.—On June 20, Basil Knox Nutman, M.D., of Norwich, to Gwendoline Woods.
POND—BALLANTINE.—On June 15, at Nether Stowey, Somerset, Hubert Charles Pond, M.C., to Margaret Mary Ballantine, M.R.C.S.
REINHOLD—DALTON.—On June 15, at Winchfield, John Drake Lucas Reinhold, B.M., to Jeune Dalton.
WHITING—SYKES.—On June 17, at Chapel Allerton, Leeds, John Michael Sturge Whiting, M.B., to Margaret Henning Sykes.

DEATHS

BROWNING.—On June 18, Samuel Barratt Browning, L.M.S.S.A. major R.A.M.C., of Handsworth Wood, Birmingham, aged 46.
CURWEN.—On June 14, at Berea, South Africa, Henry Curwen, C.B.E., M.B. Edin.
MCBRIDE.—On June 16, at York, Peter McBride, M.D. Edin., F.R.C.P.E., F.R.S.E., aged 92.

'KEMITHAL' ANÆSTHESIA.—A correspondent points out that the formula for kemithal is 5-cyclohexenyl-5-allyl-2-thiobarbituric acid, and not 5-cyclohexanyl . . . as stated in our issue of May 25, pp. 767 and 771.

Dr. John Halton informs us that he used 'Nupercaine' lozenges before operation, and not tablets (same issue, p. 772). The lozenges contain 1 mg. of nupercaine, whereas the tablets, intended for the preparation of aqueous solutions, contain 50 or 100 mg. and would be dangerous if dissolved in the mouth as described.

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REFERENCES AND ABBREVIATIONS

Institutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word Universities. (*A*) = *Annotation*, (*C*) = *Correspondence*, (*LA*) = *Leading Article*, (*ML*) = *Medicine and the Law*, (*NI*) = *New Invention*, (*O*) = *Obituary*, (*P*) = *Parliament, and* (*R*) = *Review.*

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